FLOYD | SNIDER
strategy ▪ science ▪ engineering

Two Union Square
601 Union Street, Suite 600
Seattle, WA 98101
tel: 206.292.2078 fax: 206.682.7867

Memorandum

To: Steve Teel, Washington State Department of Ecology

Copies: Gary Burleson, The Estate of Katherine Burleson and GJG, LLC
Brad Jones, Gordon, Thomas, Honeywell

From: Lynn Grochala and Tom Colligan, Floyd|Snider

Date: June 22, 2015

Project No: GTH-Olympia

Re: **Remedial Action Work Plan Addendum**

A Remedial Action Work Plan (RAWP) was prepared by Floyd|Snider and submitted to Washington State Department of Ecology (Ecology) in April 2015. The final RAWP provides details for the remedial actions that will be completed at the Former Olympia Dry Cleaners Site (Site), which is located at 606 Union Avenue Southeast in Olympia, Washington. The remedial actions, which will consist of source removal via excavation, are being completed to remove tetrachloroethene (PCE)- and trichloroethene (TCE)-contaminated soil resulting from former dry cleaning operations at the Site. The remedial actions are being completed in accordance with Ecology's October 29, 2014, Cleanup Action Plan (CAP) for the Site, and consistent with Washington Administrative Code (WAC) 173-340-360, the Model Toxics Control Act (MTCA). The cleanup objective is to remove the majority of known and reasonably accessible residual source mass soil via excavation to significantly reduce the source of groundwater contamination at the Site and eliminate or control contaminants in the existing seep.

In accordance with the RAWP, Floyd|Snider collected pre-excavation soil characterization samples in April and again in May 2015 to provide more recent and representative soil data within the proposed excavation areas. These new data were collected to facilitate disposal profiling and coordination, and were required in order to obtain Ecology's contained-in determination. The following are chemicals of concern (COCs) identified for the Site: PCE, TCE, cis-1,2-dichloroethene (DCE), trans-1,2-DCE, 1,1-DCE, and vinyl chloride. Based on the results of the pre-characterization soil data for the Site COCs, along with a recently completed geotechnical assessment, the proposed excavation limits were slightly refined from what is described in the RAWP. This RAWP Addendum describes those refinements based on additional information obtained since the submittal of the Final RAWP (Floyd|Snider 2015).

PRE-EXCAVATION SOIL CHARACTERIZATION AND MODIFIED PROPOSED EXCAVATION LIMITS

Floyd|Snider contracted with ESN Northwest on April 21 and May 19, 2015 to advance 17 soil borings for the collection of pre-excavation soil characterization samples. Using a direct-push drilling method, ESN advanced three soil borings in the main excavation area (M-PCSB-01 through M-PCSB-03) and one soil boring in the secondary excavation area (Sec-PCSB-01) on April 21, 2015. ESN advanced 6 additional soil borings in the main excavation area (M-PCSB-04 through M-PCSB-09), 4 additional borings in the secondary excavation area (Sec-PCSB-02 through Sec-PCSB-05), and 3 borings in the alley (Alley-SB01 through Alley-SB03) on May 19, 2015. Soil was field-screened with a photoionization detector (PID) during the advancement of all borings to assist in soil sample interval selection and to identify potential zones of volatile organic compound (VOC) contamination. Soil samples were collected for analysis of the Site COCs using U.S. Environmental Protection Agency (USEPA) Method 5035 and analyzed using USEPA Method 8260B. Certain samples were additionally analyzed for Toxicity Characteristic Leachate Procedure (TCLP) for PCE and TCE. A summary of the results is included in Table 1 and copies of laboratory reports are included in Attachment 1. The soil boring locations and associated PCE results are shown on Figure 1. Copies of field logs that include soil descriptions, observations, and field screening results are included in Attachment 2.

Main Excavation Area

Soil borings M-PCSB-01 through M-PCSB-03, advanced in April 2015 in the main excavation area, were co-located in the three areas with the greatest remaining PCE concentrations in soil after the Interim Action excavation in 2007 (sample Locations 06-C21@8FT, 06-C36@8FT, and 06-E07@8FT). The PCE concentrations in each of these three areas were previously greater than 14 milligrams per kilogram (mg/kg), which is the maximum allowable concentration for disposal at a Subtitle D solid waste landfill, without TCLP testing. Therefore, each of the new borings were co-located with the 2007 sample locations, and soil samples were collected from the 8 to 10 foot interval and the 10 to 12 foot interval for the Site COCs and TCLP analysis for PCE and TCE. Results indicated that the Site COCs were detected at concentrations generally less than those detected in 2007, and the TCLP concentrations for PCE and TCE were less than the acceptance levels for Subtitle D landfills. However, results from the samples collected from the 10 to 12 foot interval samples from M-PCSB-02 and M-PCSB-03 indicated that concentrations were greater than the Site cleanup levels (CULs) for PCE and other Site COCs.

Additional soil borings were advanced in May 2015 to more precisely define the COC concentrations at 12 feet below ground surface (bgs), the targeted base of the excavation in this area. Results indicated that the PCE concentrations at 12 feet bgs were all less than 0.25 mg/kg in the central portion of the excavation (M-PCSB-04 and M-PCSB-02), and were below the CUL of 0.05 mg/kg on the western extent (M-PCSB-05). Additional soil borings were advanced at the extent of the proposed excavation to confirm concentrations at these extents, and to further refine the proposed limits. Based on the additional data, the northern, southern, and eastern extents of the proposed excavation were adjusted accordingly (refer to Table 1 and Figure 1).

In addition, the excavation depth will be extended to 12 feet bgs (in lieu of the 10 to 12 foot interval proposed in the RAWP) throughout the majority of the excavation with the exception of the western edge of the excavation based on data collected from 12 feet bgs in boring M-PCSB-05 (all Site COCs were non detect).

Per the RAWP, samples will be collected from soil at the base of the excavation prior to backfilling with controlled-density fill (CDF). These pre-excavation data suggest that PCE may still exist above CULs at the base of the excavation. However, excavation deeper than 12 feet bgs is not warranted based on the very low levels of PCE expected, the technical infeasibility of excavation deeper than 12 feet bgs, and also increased risk of damage to adjacent buildings.

Secondary Excavation Area

Soil boring Sec-PCSB-01 was advanced in April 2014 to provide recent and representative data for disposal profiling and contained-in determination. Field screening during the advancement of this boring indicated the presence of VOCs at a depth between 2.5 and 3.5 feet bgs; a strong solvent-like odor was also observed. Soil samples were therefore collected from the 2 to 4 foot interval and at 5 feet bgs. The sample results indicated the presence of PCE at a concentration of 202 mg/kg, a concentration significantly higher than previous data collected in the area and greater than the land ban (land disposal restriction) concentration of 60 mg/kg, indicating a localized area of hazardous waste soils.

Due to the indication of hazardous waste soils, additional borings were advanced in May 2015 to delineate this area of hazardous waste. Four borings were advanced approximately 2.5 feet from Sec-PCSB-01 to the northeast, northwest, southeast, and southwest. The results of these additional soil samples indicated that the hazardous waste area is extremely localized. Site COCs were present at 3 feet and 5 feet bgs in the two northern borings, but at concentrations orders of magnitude less than SEC-PCSB-01 and less than the acceptance levels for a contained-in determination. Site COCs were not present at detectable concentrations in the samples collected from 3 feet bgs and 5 feet bgs in the two borings to the south. Therefore, the southern extent of the proposed secondary excavation area was adjusted accordingly (refer to Table 1 and Figure 1) and the target depth for this excavation will be extended to 6 feet bgs on the northern and eastern extents instead of 5 feet bgs.

Alley

Three soil borings were advanced in the western portion of the alley in May 2015 to collect more recent and representative data along the eastern edge of the main excavation, and to obtain additional data in areas that appeared to have data gaps. Field screening during the advancement of soil boring Alley-SB-02 indicated the presence of VOCs at a depth of 8 feet bgs and to a lesser extent at 10 feet bgs; a strong hydrocarbon-like odor was also observed. The sample results indicated the presence of PCE at a concentration of 280 mg/kg at 8 feet bgs, indicating a second localized area of hazardous waste. The sample at 10 feet bgs was much less in concentration

(17 mg/kg), but still significantly greater than the CUL and greater than the acceptance level for a Subtitle D landfill (14 mg/kg) without TCLP testing. Therefore, TCLP was also run on this sample and results were less than the acceptance criteria for a Subtitle D landfill.

The samples from boring Alley-SB-01 to the east did not contain Site COCs at detectable levels, and boring Alley-SB-03 (already within the main excavation area footprint) contained Site COCs at concentrations greater than the CULs, but orders of magnitude lower than at Alley-SB-02. As a result of the detection of an additional hazardous waste hotspot, the eastern extent of the proposed main excavation has been extended (refer to Figure 1). However, the area will be difficult to fully access due to the presence within the Alley, which only has about 6 feet of clearance between the Q-Tip Trust building and the concrete landing. Refer to the geotechnical discussion below along with the specific means and methods that will be used to attempt excavation in the area.

GEOTECHNICAL EVALUATION

Due to the close proximity of the proposed Main Excavation area to the adjacent Q-Tip Trust building, along with complications associated with artesian water in the area, Floyd|Snider requested that Paul Grant, PE, of PanGeo provide geotechnical recommendations for excavation means and methods in order to be protective of the adjacent building (as part of obtaining off-site access). Mr. Grant also reviewed the building construction plans available for the Q-Tip Trust building and visited the Site on May 19, 2015 in order to provide his recommendations.

Based on the geotechnical recommendations contained in a letter from PanGeo, which is included as Attachment 3, the main excavation should not extend deeper than 12 feet bgs and should stay a minimum of 2 feet away from the Q-Tip Trust building to avoid potential complications with the building foundation/footings. In addition, Mr. Grant recommended that a geotechnical engineer provide oversight during excavation adjacent to the building and that a minimum of one to two trucks of CDF are on-site and on standby should the need arise for immediate backfill. He also suggested that unsupported excavations in short segments may be more efficient than the use of trench boxes, which may be difficult due to the small work area and physical limitations. Unsupported trench lengths, which would be required for excavation into alley (as discussed in greater detail below), should be limited to a maximum length of 8 to 10 feet in length. These primary considerations and other pertinent geotechnical recommendations are included in the Geotechnical Recommendations letter dated June 16, 2015 (Attachment 3).

POST-EXCAVATION COMPLIANCE SOIL SAMPLES

Selected pre-characterization soil samples will be used in lieu of collecting post-excavation soil samples in both the main and the secondary excavation areas.

Main Excavation Area

In the Main excavation area, the RAWP stated that a minimum of one bottom sample per trench would be collected. Due to the proposed use of trench boxes, sidewall samples will not likely be possible to collect. The following pre-characterization samples will be used to document post-excavation conditions assuming excavation to the limits represented in these samples:

- Soil collected from soil boring M-PCSB-01 was non-detect for all Site COCs at the 8 to 10 foot interval and the 10 to 12 foot interval. The samples from this boring will act as both the sidewall and bottom sample for the eastern (not alley) edge of the excavation.
- Soil collected from M-PCSB-04 at 12 feet bgs will serve as the bottom sample in this central portion of the excavation, and will document low-level PCE concentrations that will remain at the 12 foot depth following excavation to this depth. Other COCs were not detected in this sample.
- Soil collected from boring M-PCSB-05 at 12 feet bgs will act as the bottom sample for the western edge of the excavation. Low-level Site COCs were detected in the 5 foot bgs sample; COCs were not detected in the 10 foot bgs sample.
- Soil collected from M-PCSB-06 will act as the side and bottom sample for the northern extent (indicative of low-level concentrations that will remain in place beneath the ramp).
- Soil collected from M-PCSB-07 will act as both sidewall (5 feet bgs) and bottom (10 feet bgs) sample for the northwest extent. Site COCs were not detected in this sample.

Additional post-excavation samples will be collected as feasible in the eastern extent of the main excavation in the vicinity of the southwest corner of the Q-Tip Trust building, in the west/central portion of the alley portion of the main excavation (in the original proposed limits), and also on the east and west side of the hazardous waste area in the alley.

Secondary Excavation Area

In the Secondary excavation area, the RAWP stated that bottom samples would be collected every 5 feet (equates to 2 to 3 samples) and one sample per sidewall would be collected. The following pre-characterization samples will be used to document post-excavation conditions:

- Samples collected from Sec-PCSB-04 and Sec-PCSB-05 at depths of 3 feet and 5 feet bgs did not contain Site COCs at detectable concentrations. Therefore, these samples will act as both sidewall and bottom samples on the south side of the excavation.
- The soil sample collected from Sec-PCSB-03 at 5 feet bgs was either non-detect or below the CUL for all Site COCs (vinyl chloride was the only COC detected). Therefore,

this location will act as a bottom sample for the central portion of the excavation (and the transition from 6 feet bgs to 5 feet bgs from east to west).

Additional post-excavation samples will be collected from the north and eastern sidewalls, and additional bottom samples will be collected beneath the hazardous waste area and towards the western extent of the excavation per the RAWP.

Per the RAWP, post-excavation soil samples will be submitted for laboratory analysis of the Site COCs using USEPA Method 8260B (using USEPA Method 5035 for sample preparation). Soil samples will be collected and analyzed in accordance with the Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) included as Appendix B of the RAWP.

HAZARDOUS WASTE SEGREGATION AND SOIL MANAGEMENT

There are two well-defined small, localized areas that contain PCE at concentrations greater than the Land Ban (Land Disposal Restriction) standard of 60 mg/kg (as shown by the red hatching on Figure 1). Soil from these areas will be carefully segregated into a separate roll-off container that will be lined and covered for transport and disposal as hazardous waste at a Subtitle C landfill (likely Chemical Waste Management of the Northwest in Arlington, Oregon). The segregation of these two hotspots of hazardous waste soils from the surrounding soils will be done based on the recent pre-excavation soil characterization data in conjunction with the use of field screening with a PID. Floyd|Snider found that the PID was able to easily field-identify soils with elevated levels of PCE (soils with PCE levels that were generally greater than 10 to 15 mg/kg had significant PID response).

For the secondary excavation area (Sec-PCSB-01 area), visual, olfactory, and field screening evidence of significant contamination was observed between 2.5 and 3.5 feet bgs. Therefore, at a minimum, a 4-foot-by-4-foot area will be segregated at depths between 2 and 4 feet bgs. Soil will be carefully removed in 1-foot lifts in this area and will be field screened after each pass with the excavator bucket to ensure that all material that is likely or potentially hazardous waste is segregated into the designated hazardous waste roll-off container.

A similar process will be used for the alley hazardous waste hot spot; however, this localized area is much deeper and will require segregation between 7 and 9 feet bgs. Due to physical limitations associated with getting equipment into this area and geotechnical recommendations, removal of this area will be attempted, but full removal may prove difficult if geotechnical concerns arise. Specific means and methods that will be used during excavation of this area are discussed in greater detail in the following section.

Finally, to be conservative, any other soil that is excavated that exhibits PID readings significantly greater than background and/or with solvent odor will be considered potentially hazardous and, therefore, will be segregated into the separate roll off container for disposal at the Subtitle C landfill.

EXCAVATION METHODOLOGY FOR EXTENSION OF MAIN EXCAVATION INTO ALLEY

This section describes the means and methods that will be used to attempt to remove the hazardous waste hot spot in the alley (Alley-SB-02), and is based on both conversations and recommendations from the geotechnical engineer and the contractor. This location is approximately 5 feet east of the previously proposed limits of the main excavation area, and in an area with significant physical limitations (such as close proximity to buildings and narrow access) that limit the size of construction equipment that can safely access this area. The eastern edge of the main excavation area will be extended further east into the alley to the extent practical, with a target of a minimum extension of 6 feet into the alley.

A mini-excavator or similar machine will be used to access this portion of main excavation that extends into the alley. The proposed equipment is a limited-width full rotation excavator capable of reaching a maximum excavation depth of 10 feet 11 inches bgs. The target depth for hazardous waste segregation in the vicinity of soil boring Alley-SB-02 is between 7 and 9 feet bgs, with a minimum target depth of excavation in this area of 10 feet bgs (but will extend deeper if equipment and trench stability allows). However, a trench box cannot be used in this area due to physical access limitations, so this excavation will be conducted using an open-trench method under geotechnical engineer supervision.

A minimum of one truck of CDF will be on-site on standby during this excavation. If at any time during this excavation, the geotechnical engineer has concern that the trench is too unstable or if there is potential risk to the adjacent building due to caving, the excavation will be immediately terminated, and the trench will be immediately backfilled with CDF to avoid a potential catastrophic failure. Therefore, there is a possibility that the PCE in this area may not be fully removed. To the extent practical and if timing allows, a bottom sample will be collected prior to backfilling with CDF to document the COC concentrations that will remain in place post clean-up.

SUMMARY OF PRE-CONSTRUCTION ACTIVITIES AND SCHEDULE

Field work will commence following Ecology's approval of the RAWP (Floyd|Snider 2015) and this RAWP Addendum. It is anticipated that construction activities will be initiated in mid-July 2015 and will be completed within 2 to 4 weeks. The following schedule outlines the key activities and timeline anticipated for construction of this project.

Activity	Anticipated Schedule
City of Olympia Permitting	Completed.
Contained-In Request	Submitted to Ecology June 12, 2015. Expected Ecology determination by June 30, 2015.
Access Agreement with Q-Tip Trust	Expected final agreement June 26, 2015.
Contractor Selection and Award	Week of June 22, 2015.
Initiate pumping of artesian well	Week of July 20, 2015.
Contractor mobilization, installation of Temporary Erosion and Soil Control (TESC) best management practices (BMPs) and delineation of work areas	July 27, 2015.
Relocation of Puget Sound Energy natural gas line and Q-Tip Trust building water line	Week of July 27, 2015.
Completion of secondary excavation	Week of July 27, 2015.
Initiation of main excavation	August 3, 2015.
Completion of main excavation	August 14, 2015.
Removal of TESC BMPs	Within 7 days of excavation completion.
Site restoration (including repaving and restoring vegetation areas)	Within 30 days of excavation completion.
Final inspection	Within 10 days of site restoration.

REFERENCES

Floyd|Snider. 2015. *Former Olympia Dry Cleaners Site Remedial Action Work Plan*. Prepared for Washington State Department of Ecology, Olympia, WA. 15 April.

Enclosures:

Table 1	Summary of Analytical Data for Pre-Characterization Soil Borings
Figure 1	PCE Concentrations in Pre-Characterization Soil Boring Locations and Proposed Soil Excavation Limits
Attachment 1	Laboratory Analytical Reports
Attachment 2	Field Soil Boring Logs
Attachment 3	Geotechnical Recommendations Letter Dated June 16, 2015

Table 1
Summary of Analytical Data for Pre-Characterization Soil Borings
Former Olympia Dry Cleaner
Olympia, Washington

			Location	Main Excavation Area Soil Borings									
				M-PCSB-01		M-PCSB-02		M-PCSB-03		M-PCSB-04	M-PCSB-05	M-PCSB-06	
			Sample ID	M-PCSB-01-8'-10'	M-PCSB-01-10'-12'	M-PCSB-02-8'-8.5'	M-PCSB-02-10'-12'	M-PCSB-03-8'-10'	M-PCSB-03-10'-12'	M-PCSB-04-12'	M-PCSB-05-12'	M-PCSB-06-5'	M-PCSB-06-10'
			Sample Date	4/21/2015	4/21/2015	4/21/2015	4/21/2015	4/21/2015	4/21/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015
			Sample Depth (ft bgs)	8–10	10–12	8–8.5	10–12	8–10	10–12	12	12	5	10
Chemicals of Concern	Cleanup Levels[1]	Units											
Volatile Organic Compounds by USEPA 8260C													
1,1-Dichloroethene	0.03	mg/kg		*0.061 U*	*0.073 U*	*0.11 U*	*0.11 U*	*0.12 U*	*0.08 U*				
cis-1,2-Dichloroethene	0.03	mg/kg		0.025 U	0.029 U	*0.04 U*	**0.07**	**0.63**	**0.51**	*0.030 U*	*0.032 U*	**0.09**	*0.037 U*
trans-1,2-Dichloroethene	0.043	mg/kg		0.025 U	0.029 U	0.04 U	0.04 U	*0.05 U*	0.03 U	0.030 U	0.032 U	0.02 U	0.037 U
Tetrachloroethene	0.05	mg/kg		0.025 U	0.029 U	**0.19**	**0.25**	**0.29**	**5.51**	**0.165**	0.032 U	**0.18**	**0.199**
Trichloroethene	0.03	mg/kg		0.025 U	0.029 U	*0.04 U*	*0.04 U*	**0.07**	**0.12**	*0.030 U*	*0.032 U*	**0.10**	*0.037 U*
Vinyl chloride	0.03	mg/kg		0.002 U	0.003 U	0.004 U	0.01	**0.05**	**0.06**	0.003 U	0.003 U	0.002 U	0.004 U
Volatile Organic Compounds by USEPA 8260C TCLP													
Tetrachloroethene		mg/L		0.00012 U		0.00014 U		0.00022					
Trichloroethene		mg/L		0.00012 U		0.00014 U		0.00013 U					

			Location	Main Excavation Area Soil Borings (continued)						Secondary Excavation Area Soil Borings				
				M-PCSB-07		M-PCSB-08		M-PCSB-09		Sec-PCSB-01		Sec-PCSB-02		
			Sample ID	M-PCSB-07-5'	M-PCSB-07-10'	M-PCSB-08-8'	M-PCSB-08-10'	M-PCSB-09-8'	M-PCSB-09-10'	Sec-PCSB-01-2'-4'	Sec-PCSB-01-4'-5'	Sec-PCSB-02-3'	Sec-PCSB-02-5'	Sec-PCSB-02-8'
			Sample Date	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	4/21/2015	4/21/2015	5/19/2015	5/19/2015	5/19/2015
			Sample Depth (ft bgs)	5	10	8	10	8	10	2–4	4–5	3	5	8
Chemicals of Concern	Cleanup Levels[1]	Units												
Volatile Organic Compounds by USEPA 8260C														
1,1-Dichloroethene	0.03	mg/kg								*0.10 U*	*0.07 U*			
cis-1,2-Dichloroethene	0.03	mg/kg		**0.033**	0.028 U	0.025 U	0.024 U	0.024 U	0.023 U	**13.2**	**3.4**	**5.8**	**2.2**	*0.035 U*
trans-1,2-Dichloroethene	0.043	mg/kg		0.028 U	0.028 U	0.025 U	0.024 U	0.024 U	0.023 U	0.042 U	0.03 U	0.029 U	0.028 U	0.035 U
Tetrachloroethene	0.05	mg/kg		0.028 U	0.028 U	0.025 U	**0.087**	0.046	0.023 U	**202**	**0.40**	**3.3**	**0.18**	0.035 U
Trichloroethene	0.03	mg/kg		0.028 U	0.028 U	0.025 U	0.024 U	0.024 U	0.023 U	**25.8**	**0.06**	**1.9**	0.028 U	*0.035 U*
Vinyl chloride	0.03	mg/kg		0.024	0.003 U	0.003 U	0.002 U	0.002 U	0.002 U	**0.874**	**0.15**	**1.4**	**1.2**	0.004 U
Volatile Organic Compounds by USEPA 8260C TCLP														
Tetrachloroethene		mg/L								0.11				
Trichloroethene		mg/L								0.024				

Table 1
Summary of Analytical Data for Pre-Characterization Soil Borings
Former Olympia Dry Cleaner
Olympia, Washington

			Secondary Excavation Area Soil Borings (continued)						Alley Soil Borings				
Location			Sec-PCSB-03		Sec-PCSB-04		Sec-PCSB-05		Alley-SB-01	Alley-SB-02			Alley-SB-03
Sample ID			Sec-PCSB-03-3'	Sec-PCSB-03-5'	Sec-PCSB-04-3'	Sec-PCSB-04-5'	Sec-PCSB-05-3'	Sec-PCSB-05-5'	Alley-SB-01-3'-5'	Alley-SB-02-3'-5'	Alley-SB-02-8'	Alley-SB-02-10'	Alley-SB-03-3'-5'
Sample Date			5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015	5/19/2015
Sample Depth (ft bgs)			3	5	3	5	3	5	3–5	3–5	8	10	3–5
Chemicals of Concern	Cleanup Levels[1]	Units											
Volatile Organic Compounds by USEPA 8260C													
1,1-Dichloroethene	0.03	mg/kg											
cis-1,2-Dichloroethene	0.03	mg/kg	**1.0**	0.030 U	0.028 U	0.021 U	0.025 U	0.022 U	*0.036 U*	**7.9**	**26.6**	**2.5**	**0.081**
trans-1,2-Dichloroethene	0.043	mg/kg	0.025 U	0.030 U	0.028 U	0.021 U	0.025 U	0.022 U	0.036 U	**0.053**	**0.28**	0.038 U	0.03 U
Tetrachloroethene	0.05	mg/kg	**0.70**	0.030 U	0.028 U	0.021 U	0.025 U	0.022 U	0.036 U	**2.9**	**280**	**17**	**0.69**
Trichloroethene	0.03	mg/kg	**0.035**	0.030 U	0.028 U	0.021 U	0.025 U	0.022 U	*0.036 U*	**0.5**	**12.2**	**1.4**	**0.048**
Vinyl chloride	0.03	mg/kg	**0.68**	0.018	0.003 U	0.014	0.011	0.002 U	0.004 U	**3.6**	**2.3**	**0.15**	0.003 U
Volatile Organic Compounds by USEPA 8260C TCLP													
Tetrachloroethene		mg/L										0.0708	
Trichloroethene		mg/L											

Notes:

Blank cells are intentional.

Italics Italic text indicates analyte was not detected and the reporting limit exceeds the cleanup level.

BOLD Red, bold text indicates analyte was detected and exceeds MTCA Method A.

1. Cleanup levels for the Site were specified by Ecology in the Cleanup Action Plan dated October 29, 2014.

Abbreviations:

ft bgs Feet below ground surface
mg/kg MIlligrams per kilogram
mg/L MIlligrams per liter
MTCA Model Toxics Control Act

Qualifier:

U Analyte was not detected at the given reporting limit.

Legend

- Pre-Characterization Soil Boring April 2015
- Pre-Characterization Soil Boring May 2015
- Compliance Monitoring Well
- Abandoned Well

Utilites to be Modified

- GAS — Approximate Natural Gas Main and Service Relocation by Puget Sound Energy
- GAS — Portion of Gas Main and Service to be Removed by Puget Sound Energy
- W — Approximate Water Line Relocation by Plumbing Contractor
- W — Portion of Water Line to be Removed by Plumbing Contractor

Utilities

- E — Underground Electric Line
- GAS — Underground Gas Line
- OE — Overhead Electric Line
- SW — Underground Stormwater Line
- T — Overhead Telephone Line
- W — Underground Water Line
- SS — Underground Sanitary Sewer Line

- Sidewalk
- Concrete Pad
- Building Outline
- Propery Boundary
- Excavation Limits Proposed in 2014 CAP
- Proposed Excavation Based on Pre-Characterization Data and Access
- Localized Hazardous Waste
- Building Awning
- Shrubs/Trees

Alley-SB-01:
3-5′ 0.0357 U

Location Name
Data Qualifier
Result (mg/kg)
Depth Range (bgs)

Abbreviations:
bgs = Below ground surface
CAP = Cleanup Action Plan
mg/kg = Milligrams per kilogram
PCE = Tetrachloroethene

Qualifier:
U = Analyte is not detected at the associated reporting limit.

Sec-PCSB-02:
3′ 3.32
5′ 0.181
8′ 0.0352 U

Sec-PCSB-01:
2-4′ 202
4-5′ 0.402

Sec-PCSB-04:
3′ 0.0279 U
5′ 0.0209 U

Sec-PCSB-03:
3′ 0.697
5′ 0.0295 U

Sec-PCSB-05:
3′ 0.0249 U
5′ 0.0217 U

Segregate 2'–4' as hazardous waste

Alley-SB-01:
3-5′ 0.0357 U

MW-09

Concrete Pad

Dry Cleaner Machine

Former Olympia Dry Cleaners Building

Alley-SB-02:
3-5′ 2.89
8′ 280
10′ 17

Area may not be safely accessible per geotech.

Segregate 7'–9' as hazardous waste

Alley-SB-03:
3-5′ 0.69

M-PCSB-01:
8-10′ 0.0246 U
10-12′ 0.029 U

M-PCSB-03:
8-10′ 0.289
10-12′ 5.51

Building Awning

M-PCSB-08:
8′ 0.0251 U
10′ 0.0874

MW-14

MW-11

M-PCSB-06:
5′ 0.182
10′ 0.199

M-PCSB-04:
12′ 0.165

M-PCSB-09:
8′ 0.0458
10′ 0.0226 U

M-PCSB-07:
5′ 0.0278 U
10′ 0.0278 U

M-PCSB-02:
8-8.5′ 0.194
10-12′ 0.245

M-PCSB-05:
12′ 0.0324 U

Cherry Street Q-Tip Trust Building

0 5 10 20
Scale in Feet

FLOYD | SNIDER
strategy ▪ science ▪ engineering

Remedial Action Work Plan Addendum
Former Olympia Dry Cleaners Site
Olympia, Washington

Figure 1
PCE Concentrations in Pre-Characterization
Soil Boring Locations and Proposed Soil Excavation Limits

I:\GIS\Projects\GTH-Olympia_Dry_Cleaners\MXD\Figure 1 PCE Concentrations.mxd
6/12/2015

Attachment 1
Laboratory Analytical Reports

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Floyd | Snider
Tom Colligan
601 Union St., Suite 600
Seattle, WA 98101

RE: GTH - Olympia Dry Cleaner
Lab ID: 1504185

April 28, 2015

Attention Tom Colligan:

Fremont Analytical, Inc. received 9 sample(s) on 4/21/2015 for the analyses presented in the following report.

Sample Moisture (Percent Moisture)
Volatile Organic Compounds by EPA Method 8260
Volatile Organic Compounds by SW8260/TCLP ZHE

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
President

Date: *04/28/2015*

CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner
Lab Order: 1504185

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1504185-001	M-PCSB-01-8'-10'	04/21/2015 12:15 PM	04/21/2015 4:52 PM
1504185-002	M-PCSB-01-10'-12'	04/21/2015 12:20 PM	04/21/2015 4:52 PM
1504185-003	M-PCSB-02-8'-8.5'	04/21/2015 1:10 PM	04/21/2015 4:52 PM
1504185-004	M-PCSB-02-10'-12'	04/21/2015 1:15 PM	04/21/2015 4:52 PM
1504185-005	M-PCSB-03-8'-10'	04/21/2015 1:45 PM	04/21/2015 4:52 PM
1504185-006	M-PCSB-03-10'-12'	04/21/2015 1:50 PM	04/21/2015 4:52 PM
1504185-007	Sec-PCSB-01-2'-4'	04/21/2015 2:05 PM	04/21/2015 4:52 PM
1504185-008	Sec-PCSB-01-4'-5'	04/21/2015 2:10 PM	04/21/2015 4:52 PM
1504185-009	Trip Blank	04/13/2015 1:53 PM	04/21/2015 4:52 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1504185**
Date: **4/28/2015**

CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 12:15:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-001
Matrix: Soil
Client Sample ID: **M-PCSB-01-8'-10'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	ND	0.00246		mg/Kg-dry	1	4/23/2015 1:05:00 AM
1,1-Dichloroethene	ND	0.0614		mg/Kg-dry	1	4/23/2015 1:05:00 AM
trans-1,2-Dichloroethene	ND	0.0246		mg/Kg-dry	1	4/23/2015 1:05:00 AM
cis-1,2-Dichloroethene	ND	0.0246		mg/Kg-dry	1	4/23/2015 1:05:00 AM
Trichloroethene (TCE)	ND	0.0246		mg/Kg-dry	1	4/23/2015 1:05:00 AM
Tetrachloroethene (PCE)	ND	0.0246		mg/Kg-dry	1	4/23/2015 1:05:00 AM
Surr: Dibromofluoromethane	94.5	63.7-129		%REC	1	4/23/2015 1:05:00 AM
Surr: Toluene-d8	92.0	64.3-131		%REC	1	4/23/2015 1:05:00 AM
Surr: 1-Bromo-4-fluorobenzene	104	63.1-141		%REC	1	4/23/2015 1:05:00 AM
Volatile Organic Compounds by SW8260/TCLP ZHE				Batch ID: 10605		Analyst: BC
Trichloroethene (TCE)	ND	0.124		µg/L	1	4/25/2015 4:37:00 PM
Tetrachloroethene (PCE)	ND	0.124		µg/L	1	4/25/2015 4:37:00 PM
Surr: Dibromofluoromethane	95.4	80.3-123		%REC	1	4/25/2015 4:37:00 PM
Surr: Toluene-d8	95.7	79.8-120		%REC	1	4/25/2015 4:37:00 PM
Surr: 4-Bromofluorobenzene	101	83.5-119		%REC	1	4/25/2015 4:37:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	24.3			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 12:20:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-002
Matrix: Soil
Client Sample ID: **M-PCSB-01-10'-12'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	ND	0.00290		mg/Kg-dry	1	4/23/2015 1:34:00 AM
1,1-Dichloroethene	ND	0.0725		mg/Kg-dry	1	4/23/2015 1:34:00 AM
trans-1,2-Dichloroethene	ND	0.0290		mg/Kg-dry	1	4/23/2015 1:34:00 AM
cis-1,2-Dichloroethene	ND	0.0290		mg/Kg-dry	1	4/23/2015 1:34:00 AM
Trichloroethene (TCE)	ND	0.0290		mg/Kg-dry	1	4/23/2015 1:34:00 AM
Tetrachloroethene (PCE)	ND	0.0290		mg/Kg-dry	1	4/23/2015 1:34:00 AM
Surr: Dibromofluoromethane	94.1	63.7-129		%REC	1	4/23/2015 1:34:00 AM
Surr: Toluene-d8	91.4	64.3-131		%REC	1	4/23/2015 1:34:00 AM
Surr: 1-Bromo-4-fluorobenzene	103	63.1-141		%REC	1	4/23/2015 1:34:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	29.4			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 1:10:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-003
Matrix: Soil
Client Sample ID: **M-PCSB-02-8'-8.5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	ND	0.00429		mg/Kg-dry	1	4/23/2015 2:03:00 AM
1,1-Dichloroethene	ND	0.107		mg/Kg-dry	1	4/23/2015 2:03:00 AM
trans-1,2-Dichloroethene	ND	0.0429		mg/Kg-dry	1	4/23/2015 2:03:00 AM
cis-1,2-Dichloroethene	ND	0.0429		mg/Kg-dry	1	4/23/2015 2:03:00 AM
Trichloroethene (TCE)	ND	0.0429		mg/Kg-dry	1	4/23/2015 2:03:00 AM
Tetrachloroethene (PCE)	0.194	0.0429		mg/Kg-dry	1	4/23/2015 2:03:00 AM
Surr: Dibromofluoromethane	92.0	63.7-129		%REC	1	4/23/2015 2:03:00 AM
Surr: Toluene-d8	93.8	64.3-131		%REC	1	4/23/2015 2:03:00 AM
Surr: 1-Bromo-4-fluorobenzene	100	63.1-141		%REC	1	4/23/2015 2:03:00 AM
Volatile Organic Compounds by SW8260/TCLP ZHE				Batch ID: 10605		Analyst: BC
Trichloroethene (TCE)	ND	0.137		µg/L	1	4/25/2015 5:33:00 PM
Tetrachloroethene (PCE)	ND	0.137		µg/L	1	4/25/2015 5:33:00 PM
Surr: Dibromofluoromethane	97.5	80.3-123		%REC	1	4/25/2015 5:33:00 PM
Surr: Toluene-d8	94.1	79.8-120		%REC	1	4/25/2015 5:33:00 PM
Surr: 4-Bromofluorobenzene	105	83.5-119		%REC	1	4/25/2015 5:33:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	25.0			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 1:15:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-004
Matrix: Soil
Client Sample ID: **M-PCSB-02-10'-12'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	0.00567	0.00427		mg/Kg-dry	1	4/23/2015 2:33:00 AM
1,1-Dichloroethene	ND	0.107		mg/Kg-dry	1	4/23/2015 2:33:00 AM
trans-1,2-Dichloroethene	ND	0.0427		mg/Kg-dry	1	4/23/2015 2:33:00 AM
cis-1,2-Dichloroethene	0.0739	0.0427		mg/Kg-dry	1	4/23/2015 2:33:00 AM
Trichloroethene (TCE)	ND	0.0427		mg/Kg-dry	1	4/23/2015 2:33:00 AM
Tetrachloroethene (PCE)	0.245	0.0427		mg/Kg-dry	1	4/23/2015 2:33:00 AM
Surr: Dibromofluoromethane	92.8	63.7-129		%REC	1	4/23/2015 2:33:00 AM
Surr: Toluene-d8	95.7	64.3-131		%REC	1	4/23/2015 2:33:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/23/2015 2:33:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	29.1			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 1:45:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-005
Matrix: Soil
Client Sample ID: **M-PCSB-03-8'-10'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	0.0464	0.00482		mg/Kg-dry	1	4/23/2015 3:02:00 AM
1,1-Dichloroethene	ND	0.120		mg/Kg-dry	1	4/23/2015 3:02:00 AM
trans-1,2-Dichloroethene	ND	0.0482		mg/Kg-dry	1	4/23/2015 3:02:00 AM
cis-1,2-Dichloroethene	0.632	0.0482		mg/Kg-dry	1	4/23/2015 3:02:00 AM
Trichloroethene (TCE)	0.0697	0.0482		mg/Kg-dry	1	4/23/2015 3:02:00 AM
Tetrachloroethene (PCE)	0.289	0.0482		mg/Kg-dry	1	4/23/2015 3:02:00 AM
Surr: Dibromofluoromethane	97.8	63.7-129		%REC	1	4/23/2015 3:02:00 AM
Surr: Toluene-d8	102	64.3-131		%REC	1	4/23/2015 3:02:00 AM
Surr: 1-Bromo-4-fluorobenzene	103	63.1-141		%REC	1	4/23/2015 3:02:00 AM
Volatile Organic Compounds by SW8260/TCLP ZHE				Batch ID: 10605		Analyst: BC
Trichloroethene (TCE)	ND	0.130		µg/L	1	4/25/2015 6:02:00 PM
Tetrachloroethene (PCE)	0.219	0.130		µg/L	1	4/25/2015 6:02:00 PM
Surr: Dibromofluoromethane	96.0	80.3-123		%REC	1	4/25/2015 6:02:00 PM
Surr: Toluene-d8	94.0	79.8-120		%REC	1	4/25/2015 6:02:00 PM
Surr: 4-Bromofluorobenzene	102	83.5-119		%REC	1	4/25/2015 6:02:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	27.8			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 1:50:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-006
Matrix: Soil
Client Sample ID: **M-PCSB-03-10'-12'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	0.0633	0.00300		mg/Kg-dry	1	4/23/2015 3:31:00 AM
1,1-Dichloroethene	ND	0.0750		mg/Kg-dry	1	4/23/2015 3:31:00 AM
trans-1,2-Dichloroethene	ND	0.0300		mg/Kg-dry	1	4/23/2015 3:31:00 AM
cis-1,2-Dichloroethene	0.514	0.0300		mg/Kg-dry	1	4/23/2015 3:31:00 AM
Trichloroethene (TCE)	0.119	0.0300		mg/Kg-dry	1	4/23/2015 3:31:00 AM
Tetrachloroethene (PCE)	5.51	0.300	D	mg/Kg-dry	10	4/24/2015 7:41:00 AM
Surr: Dibromofluoromethane	93.8	63.7-129		%REC	1	4/23/2015 3:31:00 AM
Surr: Toluene-d8	104	64.3-131		%REC	1	4/23/2015 3:31:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%REC	1	4/23/2015 3:31:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	26.3			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 2:05:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-007
Matrix: Soil
Client Sample ID: **Sec-PCSB-01-2'-4'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10604		Analyst: BC
Vinyl chloride	0.874	0.00417		mg/Kg-dry	1	4/23/2015 4:00:00 AM
1,1-Dichloroethene	ND	0.104		mg/Kg-dry	1	4/23/2015 4:00:00 AM
trans-1,2-Dichloroethene	ND	0.0417		mg/Kg-dry	1	4/23/2015 4:00:00 AM
cis-1,2-Dichloroethene	13.2	0.835	D	mg/Kg-dry	20	4/24/2015 8:39:00 AM
Trichloroethene (TCE)	25.8	0.835	D	mg/Kg-dry	20	4/24/2015 8:39:00 AM
Tetrachloroethene (PCE)	202	4.17	D	mg/Kg-dry	100	4/24/2015 8:10:00 AM
Surr: Dibromofluoromethane	92.3	63.7-129		%REC	1	4/23/2015 4:00:00 AM
Surr: Toluene-d8	104	64.3-131		%REC	1	4/23/2015 4:00:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/23/2015 4:00:00 AM
Volatile Organic Compounds by SW8260/TCLP ZHE				Batch ID: 10605		Analyst: BC
Trichloroethene (TCE)	24.3	2.80	D	µg/L	20	4/25/2015 6:30:00 PM
Tetrachloroethene (PCE)	111	2.80	D	µg/L	20	4/25/2015 6:30:00 PM
Surr: Dibromofluoromethane	96.6	80.3-123		%REC	1	4/25/2015 6:58:00 PM
Surr: Toluene-d8	98.0	79.8-120		%REC	1	4/25/2015 6:58:00 PM
Surr: 4-Bromofluorobenzene	98.8	83.5-119		%REC	1	4/25/2015 6:58:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R21968		Analyst: CG
Percent Moisture	25.9			wt%	1	4/23/2015 10:02:37 AM

Analytical Report

WO#: **1504185**
Date Reported: **4/28/2015**

Client: Floyd | Snider
Collection Date: 4/21/2015 2:10:00 PM
Project: GTH - Olympia Dry Cleaner
Lab ID: 1504185-008
Matrix: Soil
Client Sample ID: **Sec-PCSB-01-4'-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10616		Analyst: BC
Vinyl chloride	0.152	0.00278		mg/Kg-dry	1	4/24/2015 5:16:00 AM
1,1-Dichloroethene	ND	0.0695		mg/Kg-dry	1	4/24/2015 5:16:00 AM
trans-1,2-Dichloroethene	ND	0.0278		mg/Kg-dry	1	4/24/2015 5:16:00 AM
cis-1,2-Dichloroethene	3.35	0.278	D	mg/Kg-dry	10	4/24/2015 6:25:00 PM
Trichloroethene (TCE)	0.0559	0.0278		mg/Kg-dry	1	4/24/2015 5:16:00 AM
Tetrachloroethene (PCE)	0.402	0.0278		mg/Kg-dry	1	4/24/2015 5:16:00 AM
Surr: Dibromofluoromethane	96.4	63.7-129		%REC	1	4/24/2015 5:16:00 AM
Surr: Toluene-d8	97.4	64.3-131		%REC	1	4/24/2015 5:16:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	4/24/2015 5:16:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R21985		Analyst: CG
Percent Moisture	22.4			wt%	1	4/24/2015 9:36:25 AM

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **1504182-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **4/22/2015** RunNo: **21965**
Client ID: **BATCH** Batch ID: **10604** Analysis Date: **4/22/2015** SeqNo: **416799**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.000577						0		30	
1,1-Dichloroethene	ND	0.0144						0		30	
trans-1,2-Dichloroethene	ND	0.00577						0		30	
cis-1,2-Dichloroethene	ND	0.00577						0		30	
Trichloroethene (TCE)	ND	0.00577						0		30	
Tetrachloroethene (PCE)	ND	0.00577						0		30	
Surr: Dibromofluoromethane	0.336		0.3604		93.1	63.7	129		0		
Surr: Toluene-d8	0.332		0.3604		92.2	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.375		0.3604		104	63.1	141		0		

Sample ID **1504182-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **4/22/2015** RunNo: **21965**
Client ID: **BATCH** Batch ID: **10604** Analysis Date: **4/22/2015** SeqNo: **416801**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.358	0.000687	0.3433	0	104	51.2	146				
1,1-Dichloroethene	0.383	0.0172	0.3433	0	112	61.9	141				
trans-1,2-Dichloroethene	0.377	0.00687	0.3433	0	110	52	136				
cis-1,2-Dichloroethene	0.346	0.00687	0.3433	0	101	58.6	136				
Trichloroethene (TCE)	0.330	0.00687	0.3433	0	96.2	68.6	132				
Tetrachloroethene (PCE)	0.336	0.00687	0.3433	0	97.9	35.6	158				
Surr: Dibromofluoromethane	0.446		0.4292		104	63.7	129				
Surr: Toluene-d8	0.401		0.4292		93.5	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	0.453		0.4292		106	63.1	141				

Sample ID **LCS-10604** SampType: **LCS** Units: **mg/Kg** Prep Date: **4/22/2015** RunNo: **21965**
Client ID: **LCSS** Batch ID: **10604** Analysis Date: **4/22/2015** SeqNo: **416814**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.892	0.00200	1.000	0	89.2	56.1	130				
1,1-Dichloroethene	0.956	0.0500	1.000	0	95.6	49.7	142				

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **LCS-10604** SampType: **LCS** Units: **mg/Kg** Prep Date: **4/22/2015** RunNo: **21965**
Client ID: **LCSS** Batch ID: **10604** Analysis Date: **4/22/2015** SeqNo: **416814**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,2-Dichloroethene	0.987	0.0200	1.000	0	98.7	68	130				
cis-1,2-Dichloroethene	0.941	0.0200	1.000	0	94.1	71.3	135				
Trichloroethene (TCE)	0.871	0.0200	1.000	0	87.1	65.5	137				
Tetrachloroethene (PCE)	0.901	0.0200	1.000	0	90.1	52.7	150				
Surr: Dibromofluoromethane	1.28		1.250		103	63.7	129				
Surr: Toluene-d8	1.13		1.250		90.5	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.28		1.250		102	63.1	141				

Sample ID **MB-10604** SampType: **MBLK** Units: **mg/Kg** Prep Date: **4/22/2015** RunNo: **21965**
Client ID: **MBLKS** Batch ID: **10604** Analysis Date: **4/22/2015** SeqNo: **416815**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00200									
1,1-Dichloroethene	ND	0.0500									
trans-1,2-Dichloroethene	ND	0.0200									
cis-1,2-Dichloroethene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
Tetrachloroethene (PCE)	ND	0.0200									
Surr: Dibromofluoromethane	1.15		1.250		91.9	63.7	129				
Surr: Toluene-d8	1.15		1.250		92.3	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.27		1.250		101	63.1	141				

Sample ID **1504152-013BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **4/23/2015** RunNo: **21987**
Client ID: **BATCH** Batch ID: **10616** Analysis Date: **4/23/2015** SeqNo: **417358**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00140						0		30	
1,1-Dichloroethene	ND	0.0349						0		30	
trans-1,2-Dichloroethene	ND	0.0140						0		30	
cis-1,2-Dichloroethene	ND	0.0140						0		30	

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **1504152-013BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **4/23/2015** RunNo: **21987**
Client ID: **BATCH** Batch ID: **10616** Analysis Date: **4/23/2015** SeqNo: **417358**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	ND	0.0140						0		30	
Tetrachloroethene (PCE)	ND	0.0140						0		30	
Surr: Dibromofluoromethane	0.903		0.8734		103	63.7	129		0		
Surr: Toluene-d8	0.918		0.8734		105	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	0.883		0.8734		101	63.1	141		0		

Sample ID **1504152-014BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **4/23/2015** RunNo: **21987**
Client ID: **BATCH** Batch ID: **10616** Analysis Date: **4/24/2015** SeqNo: **417360**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.695	0.00123	0.6132	0	113	51.2	146				
1,1-Dichloroethene	0.752	0.0307	0.6132	0	123	61.9	141				
trans-1,2-Dichloroethene	0.743	0.0123	0.6132	0	121	52	136				
cis-1,2-Dichloroethene	0.775	0.0123	0.6132	0	126	58.6	136				
Trichloroethene (TCE)	0.710	0.0123	0.6132	0	116	68.6	132				
Tetrachloroethene (PCE)	0.715	0.0123	0.6132	0	117	35.6	158				
Surr: Dibromofluoromethane	0.814		0.7665		106	63.7	129				
Surr: Toluene-d8	0.855		0.7665		111	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	0.807		0.7665		105	63.1	141				

Sample ID **LCS-10616** SampType: **LCS** Units: **mg/Kg** Prep Date: **4/23/2015** RunNo: **21987**
Client ID: **LCSS** Batch ID: **10616** Analysis Date: **4/23/2015** SeqNo: **417368**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.940	0.00200	1.000	0	94.0	56.1	130				
1,1-Dichloroethene	0.877	0.0500	1.000	0	87.7	49.7	142				
trans-1,2-Dichloroethene	1.10	0.0200	1.000	0	110	68	130				
cis-1,2-Dichloroethene	1.07	0.0200	1.000	0	107	71.3	135				
Trichloroethene (TCE)	0.942	0.0200	1.000	0	94.2	65.5	137				
Tetrachloroethene (PCE)	0.916	0.0200	1.000	0	91.6	52.7	150				

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **LCS-10616**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **4/23/2015**	RunNo: **21987**
Client ID: **LCSS**	Batch ID: **10616**		Analysis Date: **4/23/2015**	SeqNo: **417368**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	1.28		1.250		102	63.7	129				
Surr: Toluene-d8	1.19		1.250		95.5	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.31		1.250		105	63.1	141				

Sample ID **MB-10616**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **4/23/2015**	RunNo: **21987**
Client ID: **MBLKS**	Batch ID: **10616**		Analysis Date: **4/23/2015**	SeqNo: **417369**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00200									
1,1-Dichloroethene	ND	0.0500									
trans-1,2-Dichloroethene	ND	0.0200									
cis-1,2-Dichloroethene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
Tetrachloroethene (PCE)	ND	0.0200									
Surr: Dibromofluoromethane	1.13		1.250		90.1	63.7	129				
Surr: Toluene-d8	1.18		1.250		94.7	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.26		1.250		101	63.1	141				

Sample ID **CCV-B-10604**	SampType: **CCV**	Units: **µg/L**	Prep Date: **4/24/2015**	RunNo: **21965**
Client ID: **CCV**	Batch ID: **10604**		Analysis Date: **4/24/2015**	SeqNo: **417391**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,2-Dichloroethene	21.6	0.0200	20.00	0	108	80	120				
cis-1,2-Dichloroethene	21.4	0.0200	20.00	0	107	80	120				
Trichloroethene (TCE)	16.7	0.0200	20.00	0	83.4	80	120				
Tetrachloroethene (PCE)	17.7	0.0200	20.00	0	88.3	80	120				
Surr: Dibromofluoromethane	26.2		25.00		105	63.7	129				
Surr: Toluene-d8	23.4		25.00		93.6	61.4	128				
Surr: 1-Bromo-4-fluorobenzene	25.5		25.00		102	63.1	141				

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by SW8260/TCLP ZHE

Sample ID **1504185-001BREP** SampType: **REP** Units: **µg/L** Prep Date: **4/22/2015** RunNo: **22015**
Client ID: **M-PCSB-01-8'-10'** Batch ID: **10605** Analysis Date: **4/25/2015** SeqNo: **417914**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	ND	0.124						0		30	
Tetrachloroethene (PCE)	ND	0.124						0		30	
Surr: Dibromofluoromethane	2.94		3.102		94.9	76	114		0		
Surr: Toluene-d8	2.87		3.102		92.5	86.8	119		0		
Surr: 4-Bromofluorobenzene	3.28		3.102		106	79.2	120		0		

Sample ID **LCS-10605** SampType: **LCS** Units: **µg/L** Prep Date: **4/22/2015** RunNo: **22015**
Client ID: **LCSW** Batch ID: **10605** Analysis Date: **4/25/2015** SeqNo: **417921**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	19.0	1.00	20.00	0	95.0	59.7	125				
Tetrachloroethene (PCE)	19.0	1.00	20.00	0	94.8	50	116				
Surr: Dibromofluoromethane	23.8		25.00		95.0	80.3	123				
Surr: Toluene-d8	24.4		25.00		97.5	79.8	120				
Surr: 4-Bromofluorobenzene	24.9		25.00		99.7	83.5	119				

Sample ID **LCSD-10605** SampType: **LCSD** Units: **µg/L** Prep Date: **4/22/2015** RunNo: **22015**
Client ID: **LCSW02** Batch ID: **10605** Analysis Date: **4/25/2015** SeqNo: **417922**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	18.2	1.00	20.00	0	90.9	59.7	125	18.99	4.36	20	
Tetrachloroethene (PCE)	17.8	1.00	20.00	0	89.0	50	116	18.95	6.20	20	
Surr: Dibromofluoromethane	23.8		25.00		95.2	80.3	123		0	0	
Surr: Toluene-d8	24.2		25.00		96.8	79.8	120		0	0	
Surr: 4-Bromofluorobenzene	26.2		25.00		105	83.5	119		0	0	

Date: *4/28/2015*

Work Order: 1504185
CLIENT: Floyd | Snider
Project: GTH - Olympia Dry Cleaner

QC SUMMARY REPORT

Volatile Organic Compounds by SW8260/TCLP ZHE

Sample ID **MB-10605** SampType: **MBLK** Units: **µg/L** Prep Date: **4/22/2015** RunNo: **22015**
Client ID: **MBLKW** Batch ID: **10605** Analysis Date: **4/25/2015** SeqNo: **417923**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	ND	1.00									
Tetrachloroethene (PCE)	ND	1.00									
Surr: Dibromofluoromethane	24.6		25.00		98.3	80.3	123				
Surr: Toluene-d8	24.5		25.00		98.0	79.8	120				
Surr: 4-Bromofluorobenzene	25.4		25.00		101	83.5	119				

Sample Log-In Check List

Client Name:	**FS**	Work Order Number:	**1504185**
Logged by:	**Erica Silva**	Date Received:	**4/21/2015 4:52:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all coolers received at a temperature of >0°C to 10.0°C	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is the headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC	Condition
Cooler	8.9	Good
Sample	8.2	Good
Temp Blank	10.8	

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1504185

Date: 4/21/15

Page: 1 of: 1

Client: Floyd Snider
Address: 601 Union St, Ste 600
City, State, Zip: Seattle, WA 98101
Tel: 206-292-2078
Reports To (PM): Tom Colligan
Fax: 206-682-7867
Email: tom.colligan@floydsnider.com

Project Name: GTH - Olympia Dry Cleaner
Location: 606 Union Ave SE, Olympia, WA
Collected by: K-Anderson
Project No: GTH - Olympia Dry Cleaner

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water

Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total [T] | Dissolved (D)	Anions (IC)***	EDB (8011)	TCLP (PCE+TCE)	HCL'd	Comments/Depth
1 M-PCSB-01-8'-10'	4/21/15	1215	S	X													X		*8260 for: PCE, TCE, cis &
2 M-PCSB-01-10'-12'		1220		X															trans-1,2 DCE, 1-1, DCE,
3 M-PCSB-02-8'-8.5'		1310		X													X		vinyl chloride
4 M-PCSB-02-10'-12'		1315		X															
5 M-PCSB-03-8'-10'		1345		X													X		
6 M-PCSB-03-10'-12'		1350		X															
7 Sec-PCSB-01-2'-4'	↓	1405	↓	X													X		
8 Sec-PCSB-01-4'-5'	4/21/15	1410	S	⊗													X		⊗ Run for K. Anderson 4/23 cg
9																			
10																			

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x	4/21/2015 1652	x	04/21/2015 1652
Relinquished	Date/Time	Received	Date/Time
x		x	

TAT -> SameDay^ NextDay^ 2 Day 3 Day (STD)

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Floyd | Snider
Tom Colligan
601 Union St., Suite 600
Seattle, WA 98101

RE: GTH - Olympia
Lab ID: 1505175

June 08, 2015

Attention Tom Colligan:

Fremont Analytical, Inc. received 33 sample(s) on 5/20/2015 for the analyses presented in the following report.

Sample Moisture (Percent Moisture)
Volatile Organic Compounds by EPA Method 8260
Volatile Organic Compounds by SW8260/TCLP ZHE

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
President

CC:
Lynn Grochala

CLIENT: Floyd | Snider
Project: GTH - Olympia
Lab Order: 1505175

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1505175-001	Sec-PCSB-02-5'	05/19/2015 8:50 AM	05/20/2015 11:38 AM
1505175-002	Sec-PCSB-02-3'	05/19/2015 9:00 AM	05/20/2015 11:38 AM
1505175-003	Sec-PCSB-03-3'	05/19/2015 9:00 AM	05/20/2015 11:38 AM
1505175-004	Sec-PCSB-03-5'	05/19/2015 8:50 AM	05/20/2015 11:38 AM
1505175-005	Sec-PCSB-04-3'	05/19/2015 9:15 AM	05/20/2015 11:38 AM
1505175-006	Sec-PCSB-04-5'	05/19/2015 9:30 AM	05/20/2015 11:38 AM
1505175-007	Sec-PCSB-05-3'	05/19/2015 9:35 AM	05/20/2015 11:38 AM
1505175-008	Sec-PCSB-05-5'	05/19/2015 9:40 AM	05/20/2015 11:38 AM
1505175-009	Sec-PCSB-02-8'	05/19/2015 9:45 AM	05/20/2015 11:38 AM
1505175-010	M-PCSB-04-12'	05/19/2015 11:00 AM	05/20/2015 11:38 AM
1505175-011	M-PCSB-04-13'	05/19/2015 11:05 AM	05/20/2015 11:38 AM
1505175-012	M-PCSB-04-14'	05/19/2015 11:10 AM	05/20/2015 11:38 AM
1505175-013	M-PCSB-04-15'	05/19/2015 11:15 AM	05/20/2015 11:38 AM
1505175-014	M-PCSB-05-12'	05/19/2015 11:25 AM	05/20/2015 11:38 AM
1505175-015	M-PCSB-05-13'	05/19/2015 11:30 AM	05/20/2015 11:38 AM
1505175-016	M-PCSB-05-14'	05/19/2015 11:35 AM	05/20/2015 11:38 AM
1505175-017	M-PCSB-05-15'	05/19/2015 11:40 AM	05/20/2015 11:38 AM
1505175-018	M-PCSB-06-5'	05/19/2015 11:50 AM	05/20/2015 11:38 AM
1505175-019	M-PCSB-06-10'	05/19/2015 11:55 AM	05/20/2015 11:38 AM
1505175-020	M-PCSB-06-12'	05/19/2015 12:00 PM	05/20/2015 11:38 AM
1505175-021	M-PCSB-07-5'	05/19/2015 12:30 PM	05/20/2015 11:38 AM
1505175-022	M-PCSB-07-10'	05/19/2015 12:35 PM	05/20/2015 11:38 AM
1505175-023	M-PCSB-07-12'	05/19/2015 12:40 PM	05/20/2015 11:38 AM
1505175-024	Alley-SB-01-3'-5'	05/19/2015 1:10 PM	05/20/2015 11:38 AM
1505175-025	Alley-SB-02-3'-5'	05/19/2015 1:40 PM	05/20/2015 11:38 AM
1505175-026	Alley-SB-02-8'	05/19/2015 1:50 PM	05/20/2015 11:38 AM
1505175-027	Alley-SB-02-10'	05/19/2015 1:55 PM	05/20/2015 11:38 AM
1505175-028	Alley-SB-03-3'-5'	05/19/2015 2:15 PM	05/20/2015 11:38 AM
1505175-029	M-PCSB-08-8'	05/19/2015 2:30 PM	05/20/2015 11:38 AM
1505175-030	M-PCSB-08-10'	05/19/2015 2:35 PM	05/20/2015 11:38 AM
1505175-031	M-PCSB-09-8'	05/19/2015 2:45 PM	05/20/2015 11:38 AM
1505175-032	M-PCSB-09-10'	05/19/2015 2:50 PM	05/20/2015 11:38 AM
1505175-033	Trip Blank	05/15/2015 7:30 AM	05/20/2015 11:38 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1505175**
Date: **6/8/2015**

CLIENT: Floyd | Snider
Project: GTH - Olympia

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below LOQ
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-001
Client Sample ID: **Sec-PCSB-02-5'**

Collection Date: 5/19/2015 8:50:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	1.18	0.00277		mg/Kg-dry	1	5/23/2015 6:52:00 PM
trans-1,2-Dichloroethene	ND	0.0277		mg/Kg-dry	1	5/23/2015 6:52:00 PM
cis-1,2-Dichloroethene	2.18	0.0277		mg/Kg-dry	1	5/23/2015 6:52:00 PM
Trichloroethene (TCE)	ND	0.0277		mg/Kg-dry	1	5/23/2015 6:52:00 PM
Tetrachloroethene (PCE)	0.181	0.0277		mg/Kg-dry	1	5/23/2015 6:52:00 PM
Surr: Dibromofluoromethane	108	63.7-129		%REC	1	5/23/2015 6:52:00 PM
Surr: Toluene-d8	103	64.3-131		%REC	1	5/23/2015 6:52:00 PM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%REC	1	5/23/2015 6:52:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	19.0			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 9:00:00 AM
Project: GTH - Olympia
Lab ID: 1505175-002
Matrix: Soil
Client Sample ID: **Sec-PCSB-02-3'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	1.40	0.00288		mg/Kg-dry	1	5/23/2015 7:48:00 PM
trans-1,2-Dichloroethene	ND	0.0288		mg/Kg-dry	1	5/23/2015 7:48:00 PM
cis-1,2-Dichloroethene	5.75	0.288	D	mg/Kg-dry	10	5/28/2015 1:21:00 PM
Trichloroethene (TCE)	1.92	0.0288		mg/Kg-dry	1	5/23/2015 7:48:00 PM
Tetrachloroethene (PCE)	3.32	0.0288		mg/Kg-dry	1	5/23/2015 7:48:00 PM
Surr: Dibromofluoromethane	107	63.7-129		%REC	1	5/23/2015 7:48:00 PM
Surr: Toluene-d8	102	64.3-131		%REC	1	5/23/2015 7:48:00 PM
Surr: 1-Bromo-4-fluorobenzene	104	63.1-141		%REC	1	5/23/2015 7:48:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	28.1			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 9:00:00 AM
Project: GTH - Olympia
Lab ID: 1505175-003
Matrix: Soil
Client Sample ID: **Sec-PCSB-03-3'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.682	0.00253		mg/Kg-dry	1	5/23/2015 9:39:00 PM
trans-1,2-Dichloroethene	ND	0.0253		mg/Kg-dry	1	5/23/2015 9:39:00 PM
cis-1,2-Dichloroethene	1.01	0.0253		mg/Kg-dry	1	5/23/2015 9:39:00 PM
Trichloroethene (TCE)	0.0348	0.0253		mg/Kg-dry	1	5/23/2015 9:39:00 PM
Tetrachloroethene (PCE)	0.697	0.0253		mg/Kg-dry	1	5/23/2015 9:39:00 PM
Surr: Dibromofluoromethane	104	63.7-129		%REC	1	5/23/2015 9:39:00 PM
Surr: Toluene-d8	103	64.3-131		%REC	1	5/23/2015 9:39:00 PM
Surr: 1-Bromo-4-fluorobenzene	105	63.1-141		%REC	1	5/23/2015 9:39:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	22.3			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 8:50:00 AM
Project: GTH - Olympia
Lab ID: 1505175-004
Matrix: Soil
Client Sample ID: **Sec-PCSB-03-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.0184	0.00295		mg/Kg-dry	1	5/23/2015 10:08:00 PM
trans-1,2-Dichloroethene	ND	0.0295		mg/Kg-dry	1	5/23/2015 10:08:00 PM
cis-1,2-Dichloroethene	ND	0.0295		mg/Kg-dry	1	5/23/2015 10:08:00 PM
Trichloroethene (TCE)	ND	0.0295		mg/Kg-dry	1	5/23/2015 10:08:00 PM
Tetrachloroethene (PCE)	ND	0.0295		mg/Kg-dry	1	5/23/2015 10:08:00 PM
Surr: Dibromofluoromethane	102	63.7-129		%REC	1	5/23/2015 10:08:00 PM
Surr: Toluene-d8	104	64.3-131		%REC	1	5/23/2015 10:08:00 PM
Surr: 1-Bromo-4-fluorobenzene	103	63.1-141		%REC	1	5/23/2015 10:08:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	21.3			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-005
Client Sample ID: **Sec-PCSB-04-3'**

Collection Date: 5/19/2015 9:15:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00279		mg/Kg-dry	1	5/23/2015 10:36:00 PM
trans-1,2-Dichloroethene	ND	0.0279		mg/Kg-dry	1	5/23/2015 10:36:00 PM
cis-1,2-Dichloroethene	ND	0.0279		mg/Kg-dry	1	5/23/2015 10:36:00 PM
Trichloroethene (TCE)	ND	0.0279		mg/Kg-dry	1	5/23/2015 10:36:00 PM
Tetrachloroethene (PCE)	ND	0.0279		mg/Kg-dry	1	5/23/2015 10:36:00 PM
Surr: Dibromofluoromethane	101	63.7-129		%REC	1	5/23/2015 10:36:00 PM
Surr: Toluene-d8	103	64.3-131		%REC	1	5/23/2015 10:36:00 PM
Surr: 1-Bromo-4-fluorobenzene	96.8	63.1-141		%REC	1	5/23/2015 10:36:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	23.8			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 9:30:00 AM
Project: GTH - Olympia
Lab ID: 1505175-006
Matrix: Soil
Client Sample ID: **Sec-PCSB-04-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.0141	0.00209		mg/Kg-dry	1	5/23/2015 11:04:00 PM
trans-1,2-Dichloroethene	ND	0.0209		mg/Kg-dry	1	5/23/2015 11:04:00 PM
cis-1,2-Dichloroethene	ND	0.0209		mg/Kg-dry	1	5/23/2015 11:04:00 PM
Trichloroethene (TCE)	ND	0.0209		mg/Kg-dry	1	5/23/2015 11:04:00 PM
Tetrachloroethene (PCE)	ND	0.0209		mg/Kg-dry	1	5/23/2015 11:04:00 PM
Surr: Dibromofluoromethane	105	63.7-129		%REC	1	5/23/2015 11:04:00 PM
Surr: Toluene-d8	102	64.3-131		%REC	1	5/23/2015 11:04:00 PM
Surr: 1-Bromo-4-fluorobenzene	105	63.1-141		%REC	1	5/23/2015 11:04:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	24.1			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-007
Client Sample ID: **Sec-PCSB-05-3'**

Collection Date: 5/19/2015 9:35:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.0112	0.00249		mg/Kg-dry	1	5/23/2015 11:32:00 PM
trans-1,2-Dichloroethene	ND	0.0249		mg/Kg-dry	1	5/23/2015 11:32:00 PM
cis-1,2-Dichloroethene	ND	0.0249		mg/Kg-dry	1	5/23/2015 11:32:00 PM
Trichloroethene (TCE)	ND	0.0249		mg/Kg-dry	1	5/23/2015 11:32:00 PM
Tetrachloroethene (PCE)	ND	0.0249		mg/Kg-dry	1	5/23/2015 11:32:00 PM
Surr: Dibromofluoromethane	102	63.7-129		%REC	1	5/23/2015 11:32:00 PM
Surr: Toluene-d8	104	64.3-131		%REC	1	5/23/2015 11:32:00 PM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	5/23/2015 11:32:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	20.4			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 9:40:00 AM
Project: GTH - Olympia
Lab ID: 1505175-008
Matrix: Soil
Client Sample ID: **Sec-PCSB-05-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00217		mg/Kg-dry	1	5/24/2015
trans-1,2-Dichloroethene	ND	0.0217		mg/Kg-dry	1	5/24/2015
cis-1,2-Dichloroethene	ND	0.0217		mg/Kg-dry	1	5/24/2015
Trichloroethene (TCE)	ND	0.0217		mg/Kg-dry	1	5/24/2015
Tetrachloroethene (PCE)	ND	0.0217		mg/Kg-dry	1	5/24/2015
Surr: Dibromofluoromethane	105	63.7-129		%REC	1	5/24/2015
Surr: Toluene-d8	105	64.3-131		%REC	1	5/24/2015
Surr: 1-Bromo-4-fluorobenzene	103	63.1-141		%REC	1	5/24/2015
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	22.1			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-009
Client Sample ID: **Sec-PCSB-02-8'**

Collection Date: 5/19/2015 9:45:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00352		mg/Kg-dry	1	5/24/2015 12:29:00 AM
trans-1,2-Dichloroethene	ND	0.0352		mg/Kg-dry	1	5/24/2015 12:29:00 AM
cis-1,2-Dichloroethene	ND	0.0352		mg/Kg-dry	1	5/24/2015 12:29:00 AM
Trichloroethene (TCE)	ND	0.0352		mg/Kg-dry	1	5/24/2015 12:29:00 AM
Tetrachloroethene (PCE)	ND	0.0352		mg/Kg-dry	1	5/24/2015 12:29:00 AM
Surr: Dibromofluoromethane	102	63.7-129		%REC	1	5/24/2015 12:29:00 AM
Surr: Toluene-d8	106	64.3-131		%REC	1	5/24/2015 12:29:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	5/24/2015 12:29:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	34.9			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-010
Client Sample ID: **M-PCSB-04-12'**

Collection Date: 5/19/2015 11:00:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00303		mg/Kg-dry	1	5/24/2015 12:57:00 AM
trans-1,2-Dichloroethene	ND	0.0303		mg/Kg-dry	1	5/24/2015 12:57:00 AM
cis-1,2-Dichloroethene	ND	0.0303		mg/Kg-dry	1	5/24/2015 12:57:00 AM
Trichloroethene (TCE)	ND	0.0303		mg/Kg-dry	1	5/24/2015 12:57:00 AM
Tetrachloroethene (PCE)	0.165	0.0303		mg/Kg-dry	1	5/24/2015 12:57:00 AM
Surr: Dibromofluoromethane	107	63.7-129		%REC	1	5/24/2015 12:57:00 AM
Surr: Toluene-d8	107	64.3-131		%REC	1	5/24/2015 12:57:00 AM
Surr: 1-Bromo-4-fluorobenzene	104	63.1-141		%REC	1	5/24/2015 12:57:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	25.4			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-014
Client Sample ID: **M-PCSB-05-12'**

Collection Date: 5/19/2015 11:25:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00324		mg/Kg-dry	1	5/24/2015 1:25:00 AM
trans-1,2-Dichloroethene	ND	0.0324		mg/Kg-dry	1	5/24/2015 1:25:00 AM
cis-1,2-Dichloroethene	ND	0.0324		mg/Kg-dry	1	5/24/2015 1:25:00 AM
Trichloroethene (TCE)	ND	0.0324		mg/Kg-dry	1	5/24/2015 1:25:00 AM
Tetrachloroethene (PCE)	ND	0.0324		mg/Kg-dry	1	5/24/2015 1:25:00 AM
Surr: Dibromofluoromethane	103	63.7-129		%REC	1	5/24/2015 1:25:00 AM
Surr: Toluene-d8	103	64.3-131		%REC	1	5/24/2015 1:25:00 AM
Surr: 1-Bromo-4-fluorobenzene	97.9	63.1-141		%REC	1	5/24/2015 1:25:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	26.8			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-018
Client Sample ID: **M-PCSB-06-5'**

Collection Date: 5/19/2015 11:50:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00245		mg/Kg-dry	1	5/24/2015 1:53:00 AM
trans-1,2-Dichloroethene	ND	0.0245		mg/Kg-dry	1	5/24/2015 1:53:00 AM
cis-1,2-Dichloroethene	0.0930	0.0245		mg/Kg-dry	1	5/24/2015 1:53:00 AM
Trichloroethene (TCE)	0.102	0.0245		mg/Kg-dry	1	5/24/2015 1:53:00 AM
Tetrachloroethene (PCE)	0.182	0.0245		mg/Kg-dry	1	5/24/2015 1:53:00 AM
Surr: Dibromofluoromethane	106	63.7-129		%REC	1	5/24/2015 1:53:00 AM
Surr: Toluene-d8	106	64.3-131		%REC	1	5/24/2015 1:53:00 AM
Surr: 1-Bromo-4-fluorobenzene	101	63.1-141		%REC	1	5/24/2015 1:53:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	19.1			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-019
Client Sample ID: **M-PCSB-06-10'**

Collection Date: 5/19/2015 11:55:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00367		mg/Kg-dry	1	5/24/2015 2:21:00 AM
trans-1,2-Dichloroethene	ND	0.0367		mg/Kg-dry	1	5/24/2015 2:21:00 AM
cis-1,2-Dichloroethene	ND	0.0367		mg/Kg-dry	1	5/24/2015 2:21:00 AM
Trichloroethene (TCE)	ND	0.0367		mg/Kg-dry	1	5/24/2015 2:21:00 AM
Tetrachloroethene (PCE)	0.199	0.0367		mg/Kg-dry	1	5/24/2015 2:21:00 AM
Surr: Dibromofluoromethane	101	63.7-129		%REC	1	5/24/2015 2:21:00 AM
Surr: Toluene-d8	107	64.3-131		%REC	1	5/24/2015 2:21:00 AM
Surr: 1-Bromo-4-fluorobenzene	103	63.1-141		%REC	1	5/24/2015 2:21:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	31.3			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 12:30:00 PM
Project: GTH - Olympia
Lab ID: 1505175-021
Matrix: Soil
Client Sample ID: **M-PCSB-07-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.0236	0.00278		mg/Kg-dry	1	5/24/2015 4:12:00 AM
trans-1,2-Dichloroethene	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:12:00 AM
cis-1,2-Dichloroethene	0.0334	0.0278		mg/Kg-dry	1	5/24/2015 4:12:00 AM
Trichloroethene (TCE)	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:12:00 AM
Tetrachloroethene (PCE)	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:12:00 AM
Surr: Dibromofluoromethane	107	63.7-129		%REC	1	5/24/2015 4:12:00 AM
Surr: Toluene-d8	106	64.3-131		%REC	1	5/24/2015 4:12:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%REC	1	5/24/2015 4:12:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	24.6			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 12:35:00 PM
Project: GTH - Olympia
Lab ID: 1505175-022
Matrix: Soil
Client Sample ID: **M-PCSB-07-10'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00278		mg/Kg-dry	1	5/24/2015 4:40:00 AM
trans-1,2-Dichloroethene	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:40:00 AM
cis-1,2-Dichloroethene	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:40:00 AM
Trichloroethene (TCE)	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:40:00 AM
Tetrachloroethene (PCE)	ND	0.0278		mg/Kg-dry	1	5/24/2015 4:40:00 AM
Surr: Dibromofluoromethane	102	63.7-129		%REC	1	5/24/2015 4:40:00 AM
Surr: Toluene-d8	105	64.3-131		%REC	1	5/24/2015 4:40:00 AM
Surr: 1-Bromo-4-fluorobenzene	99.4	63.1-141		%REC	1	5/24/2015 4:40:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	26.3			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 1:10:00 PM
Project: GTH - Olympia
Lab ID: 1505175-024
Matrix: Soil
Client Sample ID: **Alley-SB-01-3'-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00357		mg/Kg-dry	1	5/24/2015 5:08:00 AM
trans-1,2-Dichloroethene	ND	0.0357		mg/Kg-dry	1	5/24/2015 5:08:00 AM
cis-1,2-Dichloroethene	ND	0.0357		mg/Kg-dry	1	5/24/2015 5:08:00 AM
Trichloroethene (TCE)	ND	0.0357		mg/Kg-dry	1	5/24/2015 5:08:00 AM
Tetrachloroethene (PCE)	ND	0.0357		mg/Kg-dry	1	5/24/2015 5:08:00 AM
Surr: Dibromofluoromethane	105	63.7-129		%REC	1	5/24/2015 5:08:00 AM
Surr: Toluene-d8	104	64.3-131		%REC	1	5/24/2015 5:08:00 AM
Surr: 1-Bromo-4-fluorobenzene	98.2	63.1-141		%REC	1	5/24/2015 5:08:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	22.9			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 1:40:00 PM
Project: GTH - Olympia
Lab ID: 1505175-025
Matrix: Soil
Client Sample ID: **Alley-SB-02-3'-5'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	3.64	0.00376		mg/Kg-dry	1	5/24/2015 5:37:00 AM
trans-1,2-Dichloroethene	0.0527	0.0376		mg/Kg-dry	1	5/24/2015 5:37:00 AM
cis-1,2-Dichloroethene	7.87	0.376	D	mg/Kg-dry	10	5/28/2015 5:05:00 PM
Trichloroethene (TCE)	0.470	0.0376		mg/Kg-dry	1	5/24/2015 5:37:00 AM
Tetrachloroethene (PCE)	2.89	0.376	D	mg/Kg-dry	10	5/28/2015 5:05:00 PM
Surr: Dibromofluoromethane	106	63.7-129		%REC	1	5/24/2015 5:37:00 AM
Surr: Toluene-d8	108	64.3-131		%REC	1	5/24/2015 5:37:00 AM
Surr: 1-Bromo-4-fluorobenzene	98.9	63.1-141		%REC	1	5/24/2015 5:37:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	30.3			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-026
Client Sample ID: **Alley-SB-02-8'**

Collection Date: 5/19/2015 1:50:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	2.25	0.121	D	mg/Kg-dry	50	5/28/2015 7:25:00 PM
trans-1,2-Dichloroethene	0.280	0.0243		mg/Kg-dry	1	5/24/2015 6:05:00 AM
cis-1,2-Dichloroethene	26.6	1.21	D	mg/Kg-dry	50	5/28/2015 6:01:00 PM
Trichloroethene (TCE)	12.2	1.21	D	mg/Kg-dry	50	5/28/2015 6:01:00 PM
Tetrachloroethene (PCE)	280	4.86	D	mg/Kg-dry	200	5/28/2015 5:33:00 PM
Surr: Dibromofluoromethane	101	63.7-129		%REC	1	5/24/2015 6:05:00 AM
Surr: Toluene-d8	105	64.3-131		%REC	1	5/24/2015 6:05:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141	D	%REC	50	5/28/2015 6:01:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	22.0			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 1:55:00 PM
Project: GTH - Olympia
Lab ID: 1505175-027
Matrix: Soil
Client Sample ID: **Alley-SB-02-10'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	0.154	0.00381		mg/Kg-dry	1	5/24/2015 6:33:00 AM
trans-1,2-Dichloroethene	ND	0.0381		mg/Kg-dry	1	5/24/2015 6:33:00 AM
cis-1,2-Dichloroethene	2.47	0.0381		mg/Kg-dry	1	5/24/2015 6:33:00 AM
Trichloroethene (TCE)	1.44	0.0381		mg/Kg-dry	1	5/24/2015 6:33:00 AM
Tetrachloroethene (PCE)	17.0	0.762	D	mg/Kg-dry	20	5/28/2015 12:53:00 PM
Surr: Dibromofluoromethane	102	63.7-129		%REC	1	5/24/2015 6:33:00 AM
Surr: Toluene-d8	104	64.3-131		%REC	1	5/24/2015 6:33:00 AM
Surr: 1-Bromo-4-fluorobenzene	102	63.1-141		%REC	1	5/24/2015 6:33:00 AM
Volatile Organic Compounds by SW8260/TCLP ZHE				Batch ID: 10909		Analyst: EM
Tetrachloroethene (PCE)	70.8	6.37	D	µg/L	50	6/5/2015 2:21:00 PM
Surr: Dibromofluoromethane	112	80.3-123		%REC	1	6/3/2015 4:36:00 PM
Surr: Toluene-d8	104	79.8-120		%REC	1	6/3/2015 4:36:00 PM
Surr: 4-Bromofluorobenzene	100	83.5-119		%REC	1	6/3/2015 4:36:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	25.9			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-028
Client Sample ID: **Alley-SB-03-3'-5'**

Collection Date: 5/19/2015 2:15:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10848		Analyst: AK
Vinyl chloride	ND	0.00300		mg/Kg-dry	1	5/24/2015 7:01:00 AM
trans-1,2-Dichloroethene	ND	0.0300		mg/Kg-dry	1	5/24/2015 7:01:00 AM
cis-1,2-Dichloroethene	0.0809	0.0300		mg/Kg-dry	1	5/24/2015 7:01:00 AM
Trichloroethene (TCE)	0.0479	0.0300		mg/Kg-dry	1	5/24/2015 7:01:00 AM
Tetrachloroethene (PCE)	0.690	0.0300		mg/Kg-dry	1	5/24/2015 7:01:00 AM
Surr: Dibromofluoromethane	106	63.7-129		%REC	1	5/24/2015 7:01:00 AM
Surr: Toluene-d8	105	64.3-131		%REC	1	5/24/2015 7:01:00 AM
Surr: 1-Bromo-4-fluorobenzene	97.2	63.1-141		%REC	1	5/24/2015 7:01:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	17.2			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-029
Client Sample ID: **M-PCSB-08-8'**

Collection Date: 5/19/2015 2:30:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10865		Analyst: AK
Vinyl chloride	ND	0.00251		mg/Kg-dry	1	5/28/2015 7:44:00 AM
trans-1,2-Dichloroethene	ND	0.0251		mg/Kg-dry	1	5/28/2015 7:44:00 AM
cis-1,2-Dichloroethene	ND	0.0251		mg/Kg-dry	1	5/28/2015 7:44:00 AM
Trichloroethene (TCE)	ND	0.0251		mg/Kg-dry	1	5/28/2015 7:44:00 AM
Tetrachloroethene (PCE)	ND	0.0251		mg/Kg-dry	1	5/28/2015 7:44:00 AM
Surr: Dibromofluoromethane	105	63.7-129		%REC	1	5/28/2015 7:44:00 AM
Surr: Toluene-d8	101	64.3-131		%REC	1	5/28/2015 7:44:00 AM
Surr: 1-Bromo-4-fluorobenzene	107	63.1-141		%REC	1	5/28/2015 7:44:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	16.0			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-030
Client Sample ID: **M-PCSB-08-10'**

Collection Date: 5/19/2015 2:35:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10865		Analyst: AK
Vinyl chloride	ND	0.00243		mg/Kg-dry	1	5/28/2015 8:40:00 AM
trans-1,2-Dichloroethene	ND	0.0243		mg/Kg-dry	1	5/28/2015 8:40:00 AM
cis-1,2-Dichloroethene	ND	0.0243		mg/Kg-dry	1	5/28/2015 8:40:00 AM
Trichloroethene (TCE)	ND	0.0243		mg/Kg-dry	1	5/28/2015 8:40:00 AM
Tetrachloroethene (PCE)	0.0874	0.0243		mg/Kg-dry	1	5/28/2015 8:40:00 AM
Surr: Dibromofluoromethane	90.1	63.7-129		%REC	1	5/28/2015 8:40:00 AM
Surr: Toluene-d8	88.7	64.3-131		%REC	1	5/28/2015 8:40:00 AM
Surr: 1-Bromo-4-fluorobenzene	95.9	63.1-141		%REC	1	5/28/2015 8:40:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	24.5			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Project: GTH - Olympia
Lab ID: 1505175-031
Client Sample ID: **M-PCSB-09-8'**

Collection Date: 5/19/2015 2:45:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10865		Analyst: AK
Vinyl chloride	ND	0.00238		mg/Kg-dry	1	5/28/2015 10:31:00 AM
trans-1,2-Dichloroethene	ND	0.0238		mg/Kg-dry	1	5/28/2015 10:31:00 AM
cis-1,2-Dichloroethene	ND	0.0238		mg/Kg-dry	1	5/28/2015 10:31:00 AM
Trichloroethene (TCE)	ND	0.0238		mg/Kg-dry	1	5/28/2015 10:31:00 AM
Tetrachloroethene (PCE)	0.0458	0.0238		mg/Kg-dry	1	5/28/2015 10:31:00 AM
Surr: Dibromofluoromethane	85.8	63.7-129		%REC	1	5/28/2015 10:31:00 AM
Surr: Toluene-d8	69.5	64.3-131		%REC	1	5/28/2015 10:31:00 AM
Surr: 1-Bromo-4-fluorobenzene	94.9	63.1-141		%REC	1	5/28/2015 10:31:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	25.5			wt%	1	5/21/2015 2:41:51 PM

Analytical Report

WO#: **1505175**
Date Reported: **6/8/2015**

Client: Floyd | Snider
Collection Date: 5/19/2015 2:50:00 PM
Project: GTH - Olympia
Lab ID: 1505175-032
Matrix: Soil
Client Sample ID: **M-PCSB-09-10'**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Volatile Organic Compounds by EPA Method 8260				Batch ID: 10865		Analyst: AK
Vinyl chloride	ND	0.00226		mg/Kg-dry	1	5/28/2015 11:00:00 AM
trans-1,2-Dichloroethene	ND	0.0226		mg/Kg-dry	1	5/28/2015 11:00:00 AM
cis-1,2-Dichloroethene	ND	0.0226		mg/Kg-dry	1	5/28/2015 11:00:00 AM
Trichloroethene (TCE)	ND	0.0226		mg/Kg-dry	1	5/28/2015 11:00:00 AM
Tetrachloroethene (PCE)	ND	0.0226		mg/Kg-dry	1	5/28/2015 11:00:00 AM
Surr: Dibromofluoromethane	82.5	63.7-129		%REC	1	5/28/2015 11:00:00 AM
Surr: Toluene-d8	69.5	64.3-131		%REC	1	5/28/2015 11:00:00 AM
Surr: 1-Bromo-4-fluorobenzene	86.0	63.1-141		%REC	1	5/28/2015 11:00:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R22523		Analyst: CG
Percent Moisture	26.9			wt%	1	5/21/2015 2:41:51 PM

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **1505175-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **5/22/2015** RunNo: **22585**
Client ID: **Sec-PCSB-02-5'** Batch ID: **10848** Analysis Date: **5/23/2015** SeqNo: **427781**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	1.30	0.00277						1.176	9.92	30	
trans-1,2-Dichloroethene	ND	0.0277						0		30	
cis-1,2-Dichloroethene	2.31	0.0277						2.178	5.99	30	
Trichloroethene (TCE)	ND	0.0277						0		30	
Tetrachloroethene (PCE)	0.242	0.0277						0.1810	28.9	30	
Surr: Dibromofluoromethane	1.91		1.734		110	63.7	129		0		
Surr: Toluene-d8	1.90		1.734		109	64.3	131		0		
Surr: 1-Bromo-4-fluorobenzene	1.68		1.734		96.8	63.1	141		0		

Sample ID **1505175-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **5/22/2015** RunNo: **22585**
Client ID: **Sec-PCSB-02-3'** Batch ID: **10848** Analysis Date: **5/23/2015** SeqNo: **427782**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	3.18	0.00288	1.442	1.400	123	51.2	146				
trans-1,2-Dichloroethene	1.65	0.0288	1.442	0.02595	113	52	136				
cis-1,2-Dichloroethene	10.7	0.0288	1.442	9.110	112	58.6	136				E
Trichloroethene (TCE)	3.85	0.0288	1.442	1.921	134	68.6	132				S
Tetrachloroethene (PCE)	4.77	0.0288	1.442	3.324	100	35.6	158				
Surr: Dibromofluoromethane	1.85		1.802		103	63.7	129				
Surr: Toluene-d8	1.88		1.802		104	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.78		1.802		99.0	63.1	141				

NOTES:
S - Outlying QC recoveries were observed. The method is in control as indicated by the LCS.

Sample ID **LCS-10848** SampType: **LCS** Units: **mg/Kg** Prep Date: **5/22/2015** RunNo: **22585**
Client ID: **LCSS** Batch ID: **10848** Analysis Date: **5/23/2015** SeqNo: **427806**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	1.01	0.00200	1.000	0	101	56.1	130				
trans-1,2-Dichloroethene	0.952	0.0200	1.000	0	95.2	68	130				
cis-1,2-Dichloroethene	1.04	0.0200	1.000	0	104	71.3	135				

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **LCS-10848**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **5/22/2015**	RunNo: **22585**
Client ID: **LCSS**	Batch ID: **10848**		Analysis Date: **5/23/2015**	SeqNo: **427806**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene (TCE)	1.12	0.0200	1.000	0	112	65.5	137				
Tetrachloroethene (PCE)	0.968	0.0200	1.000	0	96.8	52.7	150				
Surr: Dibromofluoromethane	1.27		1.250		101	63.7	129				
Surr: Toluene-d8	1.30		1.250		104	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.24		1.250		99.1	63.1	141				

Sample ID **MB-10848**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **5/22/2015**	RunNo: **22585**
Client ID: **MBLKS**	Batch ID: **10848**		Analysis Date: **5/23/2015**	SeqNo: **427807**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00200									
trans-1,2-Dichloroethene	ND	0.0200									
cis-1,2-Dichloroethene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
Tetrachloroethene (PCE)	ND	0.0200									
Surr: Dibromofluoromethane	1.33		1.250		106	63.7	129				
Surr: Toluene-d8	1.33		1.250		107	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.24		1.250		99.2	63.1	141				

Sample ID **1505175-029BDUP**	SampType: **DUP**	Units: **mg/Kg-dry**	Prep Date: **5/26/2015**	RunNo: **22626**
Client ID: **M-PCSB-08-8'**	Batch ID: **10865**		Analysis Date: **5/28/2015**	SeqNo: **428581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00251						0		30	
trans-1,2-Dichloroethene	ND	0.0251						0		30	
cis-1,2-Dichloroethene	ND	0.0251						0		30	
Trichloroethene (TCE)	ND	0.0251						0		30	
Tetrachloroethene (PCE)	ND	0.0251						0		30	
Surr: Dibromofluoromethane	1.56		1.489		105	63.7	129		0		
Surr: Toluene-d8	1.50		1.489		101	64.3	131		0		

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **1505175-029BDUP**	SampType: **DUP**			Units: **mg/Kg-dry**		Prep Date: **5/26/2015**		RunNo: **22626**	
Client ID: **M-PCSB-08-8'**	Batch ID: **10865**					Analysis Date: **5/28/2015**		SeqNo: **428581**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 1-Bromo-4-fluorobenzene	1.69		1.489		113	63.1	141		0		

Sample ID **1505175-030BMS**	SampType: **MS**			Units: **mg/Kg-dry**		Prep Date: **5/26/2015**		RunNo: **22626**	
Client ID: **M-PCSB-08-10'**	Batch ID: **10865**					Analysis Date: **5/28/2015**		SeqNo: **428583**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	1.48	0.00243	1.325	0	112	51.2	146				
trans-1,2-Dichloroethene	1.45	0.0243	1.325	0	109	52	136				
cis-1,2-Dichloroethene	1.24	0.0243	1.325	0.006069	93.4	58.6	136				
Trichloroethene (TCE)	1.48	0.0243	1.325	0	112	68.6	132				
Tetrachloroethene (PCE)	1.70	0.0243	1.325	0.08740	122	35.6	158				
Surr: Dibromofluoromethane	1.50		1.656		90.4	63.7	129				
Surr: Toluene-d8	1.77		1.656		107	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.27		1.656		76.8	63.1	141				

Sample ID **LCS-10865**	SampType: **LCS**			Units: **mg/Kg**		Prep Date: **5/26/2015**		RunNo: **22626**	
Client ID: **LCSS**	Batch ID: **10865**					Analysis Date: **5/28/2015**		SeqNo: **428590**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	0.944	0.00200	1.000	0	94.4	56.1	130				
trans-1,2-Dichloroethene	1.00	0.0200	1.000	0	100	68	130				
cis-1,2-Dichloroethene	0.964	0.0200	1.000	0	96.4	71.3	135				
Trichloroethene (TCE)	1.05	0.0200	1.000	0	105	65.5	137				
Tetrachloroethene (PCE)	0.956	0.0200	1.000	0	95.6	52.7	150				
Surr: Dibromofluoromethane	1.25		1.250		100	63.7	129				
Surr: Toluene-d8	1.24		1.250		99.2	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.26		1.250		101	63.1	141				

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method 8260

Sample ID **MB-10865**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **5/26/2015**	RunNo: **22626**
Client ID: **MBLKS**	Batch ID: **10865**		Analysis Date: **5/28/2015**	SeqNo: **428591**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.00200									
trans-1,2-Dichloroethene	ND	0.0200									
cis-1,2-Dichloroethene	ND	0.0200									
Trichloroethene (TCE)	ND	0.0200									
Tetrachloroethene (PCE)	ND	0.0200									
Surr: Dibromofluoromethane	1.29		1.250		103	63.7	129				
Surr: Toluene-d8	1.23		1.250		98.0	64.3	131				
Surr: 1-Bromo-4-fluorobenzene	1.25		1.250		100	63.1	141				

Sample ID **CCV-D-10848**	SampType: **CCV**	Units: **µg/L**	Prep Date: **5/28/2015**	RunNo: **22585**
Client ID: **CCV**	Batch ID: **10848**		Analysis Date: **5/28/2015**	SeqNo: **428653**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	18.6	0.00200	20.00	0	92.8	80	120				
cis-1,2-Dichloroethene	19.6	0.0200	20.00	0	98.0	80	120				
Trichloroethene (TCE)	20.9	0.0200	20.00	0	105	80	120				
Tetrachloroethene (PCE)	20.0	0.0200	20.00	0	100	80	120				
Surr: Dibromofluoromethane	25.1		25.00		100	63.7	129				
Surr: Toluene-d8	24.9		25.00		99.6	61.4	128				
Surr: 1-Bromo-4-fluorobenzene	25.2		25.00		101	63.1	141				

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by SW8260/TCLP ZHE

Sample ID **LCS-10909**	SampType: **LCS**			Units: **µg/L**		Prep Date: **6/2/2015**			RunNo: **22768**	
Client ID: **LCSW**	Batch ID: **10909**					Analysis Date: **6/3/2015**			SeqNo: **431261**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Tetrachloroethene (PCE)	21.9	1.00	20.00	0	109	50	116				
Surr: Dibromofluoromethane	28.9		25.00		116	80.3	123				
Surr: Toluene-d8	25.2		25.00		101	79.8	120				
Surr: 4-Bromofluorobenzene	25.3		25.00		101	83.5	119				

Sample ID **LCSD-10909**	SampType: **LCSD**			Units: **µg/L**		Prep Date: **6/2/2015**			RunNo: **22768**	
Client ID: **LCSW02**	Batch ID: **10909**					Analysis Date: **6/3/2015**			SeqNo: **431262**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Tetrachloroethene (PCE)	22.3	1.00	20.00	0	112	50	116	21.87	2.06	20	
Surr: Dibromofluoromethane	29.4		25.00		118	80.3	123		0	0	
Surr: Toluene-d8	25.7		25.00		103	79.8	120		0	0	
Surr: 4-Bromofluorobenzene	25.0		25.00		100	83.5	119		0	0	

Sample ID **MB-10909**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **6/2/2015**			RunNo: **22768**	
Client ID: **MBLKW**	Batch ID: **10909**					Analysis Date: **6/3/2015**			SeqNo: **431263**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Tetrachloroethene (PCE)	ND	1.00									
Surr: Dibromofluoromethane	28.8		25.00		115	80.3	123				
Surr: Toluene-d8	25.8		25.00		103	79.8	120				
Surr: 4-Bromofluorobenzene	24.9		25.00		99.7	83.5	119				

Sample ID **CCV-C-10909**	SampType: **CCV**			Units: **µg/L**		Prep Date: **6/5/2015**			RunNo: **22768**	
Client ID: **CCV**	Batch ID: **10909**					Analysis Date: **6/5/2015**			SeqNo: **432432**	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Tetrachloroethene (PCE)	23.0	1.00	20.00	0	115	80	120				
Surr: Dibromofluoromethane	28.2		25.00		113	76	114				
Surr: Toluene-d8	33.8		25.00		135	86.8	119				S

Work Order: 1505175
CLIENT: Floyd | Snider
Project: GTH - Olympia

QC SUMMARY REPORT

Volatile Organic Compounds by SW8260/TCLP ZHE

Sample ID **CCV-C-10909** SampType: **CCV** Units: **µg/L** Prep Date: **6/5/2015** RunNo: **22768**
Client ID: **CCV** Batch ID: **10909** Analysis Date: **6/5/2015** SeqNo: **432432**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	25.2		25.00		101	79.2	120				

NOTES:
S - Outlying surrogate recovery observed. Toluene-d8 is not associated with PCE. No further action required.

Sample Log-In Check List

Client Name:	**FS**	Work Order Number:	**1505175**
Logged by:	**Clare Griggs**	Date Received:	**5/20/2015 11:38:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Courier		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	5.0
Sample	2.7

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (Internal): 1505175

Date: 5/19/15

Page: 1 of: 4

Client: Floyd | Snider
Address: 601 Union St, ste 600
City, State, Zip: Seattle, WA 98101
Tel: 206-292-2078 Fax:

Project Name: GTH - Olympia
Project No:
Location:
Collected by: KA LG
Reports To (PM): Lynn Grochala & Tom Colligan
Email: lynn.grochala@floydsnider.com tom.colligan@floydsnider.com

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water, SW = Strom Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260) *	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020) / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	Comments/Depth
1	Sec-PCSB-02-5'	5/19/15	0930	soil	X														* cVOCs are PCE, TCE, cis- & trans-1,2 DCE, vinyl chloride
2	Sec-PCSB-02-3'		0900		X														
3	Sec-PCSB-03-3'		0900		X														
4	Sec-PCSB-03-5'		0850		X														
5	Sec-PCSB-04-3'		0915		X														
6	Sec-PCSB-04-5'		0930		X														
7	Sec-PCSB-03-3'		0935		X														
8	Sec-PCSB-05-5'		0940		X														
9	Sec-PCSB-02-8'		0945		X														
10	M-PCSB-04-12'		1100		X														

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x	5/20/15 1040	x CHRISTINE SNEAD	5/20/15 10:40
x Christine Snead	5/20/15 11:38	x	05/20/15 11:38

TAT -> SameDay^ NextDay^ 2 Day 3 Day (STD)
^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

Fremont Analytical — Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): _____

Date: 5/19/15 Page: 2 of: 4

Client: FS
Address: See p. 1
City, State, Zip:
Tel: Fax:

Project Name: GTH - Olympia
Project No: Collected by:
Location:
Reports To (PM):
Email:

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water, SW = Storm Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	HOLD			Comments/Depth
1	M-PCSB-04-13'	5/19/15	1105	Soil														X			* CVOCs including
2	M-PCSB-04-14'		1110															X			PCE, TCE, cis- &
3	M-PCSB-04-15'		1115															X			trans-1,2 DCE,
4	M-PCSB-05-12'		1125		X																Vinyl chloride
5	M-PCSB-05-13'		1130															X			
6	M-PCSB-05-14'		1135															X			
7	M-PCSB-05-15'		1140															X			
8	M-PCSB-06-5'		1150		X																
9	M-PCSB-06-10'		1155		X																
10	M-PCSB-06-12'		1200		X	X												X			

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x [signature]	5/20/15 1040	x [signature]	5/20/15 10:40
x Christine Sund	5/20/15 11:38	x [signature]	05/20/15 11:38

TAT -> SameDay^ NextDay^ 2 Day 3 Day (STD)
^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): _____

Date: 5/19/15 Page: 3 of: 4

Client: FS
Address: See p. 1
City, State, Zip:
Tel: Fax:

Project Name: GTH - Olympic
Project No: Collected by:
Location:
Reports To (PM):
Email:

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water, SW = Storm Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total (T)	Dissolved (D)	Anions (IC)***	EDB (8011)	HOLD		Comments/Depth
1	M-PCSB-07-5'	5/19/15	1230	soil	X																+ COCs: PCE, TCE
2	M-PCSB-07-10'		1235		X																cis- + trans- 1,2 DCE,
3	M-PCSB-07-12'		1240		X														X		vinyl chloride
4	Alley-SB-01-3'-5'		1310		X																
5	Alley-SB-02-3'-5'		1340		X																
6	Alley-SB-02-8'		1350		X																
7	Alley-SB-02-10'		1355		X																
8	Alley-SB-03-3'-5'		1415		X																
9	M-PCSB-08-8'		1430		X																
10	M-PCSB-08-10'		1435		X																

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x	5/20/15 1040	x Christine Arend	5/20/15 10:40
x Christine Arend	5/20/15 1:38	x	05/29/15

TAT -> SameDay^ NextDay^ 2 Day 3 Day (STD)
^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): _____

Date: 5/19/15

Page: 4 of: 4

Client: ES

Address: See p. 1

City, State, Zip

Tel: Fax:

Project Name: GTH - Olympia

Project No: Collected by:

Location:

Reports To (PM):

Email:

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water, SW = Strom Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon Identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270 - SIM)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020 / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	Comments/Depth
1	M-PCSB-09-8'	5/19/15	1445	Soil	X													CVOCs: PCE, TCE, cis + trans - 1,2 DCE, vinyl chloride
2	M-PCSB-09-10'	↓	1450	↓	X													
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x	5/20/15 1040	x Christine Smead	5/20/15 10:40
x Christine Smead	5/20/15 11:38	x	05/20/15 11:38

TAT -> SameDay^ NextDay^ 2 Day 3 Day STD

^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

Fremont Analytical

Chain of Custody Record

3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Laboratory Project No (internal): 1505175A
Date: 5/19/15
Page: 3 of: 4

Client: FS
Address: See p. 1
City, State, Zip:
Tel: Fax:

Project Name: GTH - Olympic
Project No:
Location:
Reports To (PM):
Collected by:
Email:

*Matrix Codes: A = Air, AQ = Aqueous, B = Bulk, O = Other, P = Product, S = Soil, SD = Sediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, WW = Waste Water, SW = Strom Water

	Sample Name	Sample Date	Sample Time	Sample Type (Matrix)*	VOC (EPA 8260)	GX/BTEX	BTEX	Gasoline Range Organics (GX)	Hydrocarbon identification (HCID)	Diesel/Heavy Oil Range Organics (DX)	SEMI VOL (EPA 8270)	PAH (EPA 8270 - SIM)	PCBs (EPA 8082)	Metals** (6020) / 200.8)	Total (T) / Dissolved (D)	Anions (IC)***	EDB (8011)	HOLD	VOC-TCLP-PCE	Comments/Depth
1	M-PCSB-07-5'	5/19/15	1230	Soil	X															+ CUOCs: PCE, TCE
2	M-PCSB-07-10'		1235		X															cis- + trans- 1,2 DCE,
3	M-PCSB-07-12'		1240		X														X	vinyl chloride
4	Alley-SB01-3'-5'		1310		X															
5	Alley-SB02-3'-5'		1340		X															
6	Alley-SB02-8'		1350		X															
7	Alley-SB02-10'		1355		X															
8	Alley-SB03-3'-5'		1415		X														X	(X) Add Analysis TCLP-PCE only STANDARD TAT 6/1/15
9	M-PCSB-08-8'		1430		X															
10	M-PCSB-08-10'		1435		X															

**Metals Analysis (Circle): MTCA-5 RCRA-8 Priority Pollutants TAL Individual: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sr Sn Ti Tl U V Zn

***Anions (Circle): Nitrate Nitrite Chloride Sulfate Bromide O-Phosphate Fluoride Nitrate+Nitrite

Sample Disposal: Return to Client Disposal by Lab (A fee may be assessed if samples are retained after 30 days.)

Turn-around times for samples received after 4:00pm will begin on the following business day.

Special Remarks:

Relinquished	Date/Time	Received	Date/Time
x	5/20/15 1040	x	5/20/15 10:40
x	5/20/15 1136	x	05/29/15

TAT -> SameDay^ NextDay^ 2 Day 3 Day STD
^Please coordinate with the lab in advance

Distribution: White - Lab, Yellow - File, Pink - Originator

www.fremontanalytical.com

Attachment 2
Field Soil Boring Logs

FLOYD | SNIDER
strategy • science • engineering

PROJECT: GTH - Olympia Dry Cleaner	LOCATION:	BORING ID: M-PCSB-01
LOGGED BY: K. Anderson	COORDINATE SYSTEM:	
DRILLED BY: ESN - Brian Bowes + Trevor Peterson	NORTHING:	EASTING:
DRILLING EQUIPMENT: AMS Power Probe 9630	GROUND SURFACE ELEVATION:	
DRILLING METHOD: 2" x 5' rods w/ liners	TOTAL DEPTH (ft bgs): 15'	DEPTH TO WATER (ft bgs):
SAMPLING METHOD: direct push	BORING DIAMETER: 2"	DRILL DATE: 4/21/15

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0		~~no recovery KA tops 5 ft of~~				0	
1	GW	~~CORE~~ Drove to 10' to ensure recovery; in ~~CORE~~, fill material does not enter sampler (in core)					
2		2' moist, dk brown GRAVEL w/ SAND + silt at 3' (in core), becomes wet (in core; ~8' bgs)					
3		at 3.75 ft, moist gray very fine silty SAND (presumed native)					
4		slight red-brown mottling					
5							
6							
7							
8	SM						M-PCSB01-8'-10' @ 1215 (from contact w/ backfill to 10')
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11		at 10 ft, 1' of slough then same as above. very stiff at 11 ft				0	M-PCSB-01-10'-12' @ 1220
12							
13							
14							
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT: 6TH - Olympia Dry Cleaners	LOCATION:	BORING ID: M-PCSB-02
LOGGED BY: K. Anderson	COORDINATE SYSTEM:	
DRILLED BY: ESN - Brian Bowles, Trevor Peterson	NORTHING:	EASTING:
DRILLING EQUIPMENT: AMS Power Probe	GROUND SURFACE ELEVATION:	
DRILLING METHOD: Direct push	TOTAL DEPTH (ft bgs): 15'	DEPTH TO WATER (ft bgs):
SAMPLING METHOD: 2" x 5' lined core	BORING DIAMETER: 2"	DRILL DATE: 4/21/15

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	GW	very moist, dark brown GRAVEL with sand. at 1.25 ft, moist				0	
1	SM	gray stiff silty SAND					
2							
3							
4							
5		real lense at 5 ft				1	
6						1	
7							
						10	
8		at 8.~~25~~ ft, becomes wet. NA				108	
		rain bow sheen + HC odor present to 8.25 ft				88	M-PCSB-02-8'-8.5' @ 1310
9						10	
						1	
10						1	

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID:
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11		soft + wet 10 - 12ft, stiff at 12.5 ft				0	M-PCSB-02-10'-12' @ 1315
12							
13							
14							
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT: 6TH - Olympia Dry Cleaner	LOCATION:	BORING ID: M-PCSB-03
LOGGED BY: R. Anderson	COORDINATE SYSTEM:	
DRILLED BY: ESN - Brian Bowes, Trevor Peterson	NORTHING:	EASTING:
DRILLING EQUIPMENT: AMS Power Probe	GROUND SURFACE ELEVATION:	
DRILLING METHOD: Direct Push	TOTAL DEPTH (ft bgs): 15'	DEPTH TO WATER (ft bgs):
SAMPLING METHOD: 2" x 5' lined core	BORING DIAMETER: 2"	DRILL DATE: 4/21/15

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	OL-OH	moist, brown ORGANIC SOIL.		X		0	
1	GW(?)	no recovery below 0.5 ft					
2							
3							
4							
5		at 5 ft, loose, wet gravel w/ sand + silt. poor recovery (likely backfill				0	
6							
7	ML SM	at 7 ft, brown, plastic SILT. at 7.5 ft, gray, mostly fine silty SAND. dk gray at 9.5 ft					
8							M-PCSB-03-8'-10' @ 1345
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11		at 10 ft, 1' of gravel + silt slough, then soft + wet silty sand brown				0	M-PCSB-03-10'-12' @ 1350
12							
13		at 13.5 ft, becomes firm slight sheen + wood fragments at 13.5 ft. no odor or PID response -					
14							
15						2	
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES: 7 ft N & 7 ft E of NE bldg (well) corner

FLOYD | SNIDER
strategy • science • engineering

PROJECT: GTH - Olympia Dry Cleaners	LOCATION:	BORING ID: Sec-PCSB-01
LOGGED BY: K. Anderson	COORDINATE SYSTEM:	
DRILLED BY: ESN. Brian Boves, Trevor Peterson	NORTHING:	EASTING:
DRILLING EQUIPMENT: AMS Power Probe	GROUND SURFACE ELEVATION:	
DRILLING METHOD: direct push	TOTAL DEPTH (ft bgs): 5'	DEPTH TO WATER (ft bgs):
SAMPLING METHOD: 2" x 5' lined core	BORING DIAMETER: 2"	DRILL DATE: 4/21/15

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	OL-OH	moist, dk brown ORGANIC SOIL at surface, then moist, gray + brown mottled sandy SILT with few small rounded gravel.					
1	ML						
2					10		Sec-PCSB-01-2'-4' @ 1405
		at 2.5 ft, small pocket of coarse black sand strong solvent odor 2.5-3.5 ft.			308		
3					805		
					300		
4					15		Sec-PCSB-01-4'-5' @ 1410
					5		
5					0		
6							
7							
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID: Sec-PCSB-02
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	PID #of Blows (PS)	PID (ppm) (rental)	Sample ID
0	OL-OH	grass + soil, then moist, dense SILT. sample appears very compressed.					
1	ML						
2							
3							
4							Sec-PCSB-03-3' @0900
5						16.1 7.4	Sec-PCSB-03-0858 5' @
6						0.1 0.1	
7	SP-SM	soil: wet at 6.5 ft, at 7 ft, wet silty SAND					
8						0.2 0.1	Sec-PCSB-02-8'@ 0945
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID: Sec-PCSB-03
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	OL-OH	soil + grass, then stiff moist					
1	ML	SILT w/ few rounded gravel					
2							
3							
4				0.6	2.1		Sec-PCSB-03-3' @ 0900
5				0.2	0.6		Sec-PCSB-03-5' @ 0850
6							
7							
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: Sed-PCSB-04
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	PID # of Blows	PID (ppm)	Sample ID
0	OL-OH	Brown soil + grass, then moist gray stiff SILT					
1	ML						
2							
3							
4							Sed-PCSB-04-3' @ 0915
5		at 5 ft. becomes soft, wet + sandy		.1/.2			Sed-PCSB-04-5' @ 0930
6							
7		firm at 7.3 ft					
8				.4/.6			
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: Sec - PCSB-05
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	OL-OH	brown soil + grass, then moist stiff gray SILT w/ few wood fragments + gravel					
1	ML						
2							
3							
4							w/1 Sec - PCSB-05-3' @ 0935
5							w/1 Sec - PCSB-05-5' @ 0940
6							
7							
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID: MW-PCSB-04
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0		6" of					
	ML	moist SILT w/ abundant gravel, then					
1	GW	gravel backfill w/ sand (v. poor					
		recovery)					
2							
3							
4							
5							
6							
7							
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11	ML	at 10 ft, 1' of slough (gravel), then stiff gray SILT					
12						0.0	M-PCSB-04-12' @ 1100
13	SP	at 13.5 ft, wet V. fine gray SAND				0.1	M-PCSB-04-13' @ 1105
14						0.1	M-PCSB-04-14' @ 1110
15						0.2	M-PCSB-04-15' @ 1115
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:	LOCATION:	BORING ID: M-PCSB-05
LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:	NORTHING:	EASTING:
DRILLING EQUIPMENT:	GROUND SURFACE ELEVATION:	
DRILLING METHOD:	TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:	BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	GW	gravel + sand, then stiff gray + brown SILT w/ wood fragments					
1	ML						
2							
3							
4							
5		red mottling beginning at 5 ft					
6							
7		at 7.5 ft, AC odor					
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
		at 10 ft, soft + wet			ES	rented	
11							
12	SP	at 12.5 ft, soft wet gray v. fine SAND w/ silt			0.7/0.2		M-PCSB-05-12' @ 1125
13					0.4/0.3		M-PCSB-05-13' @ 1130
14					0.8/0.4		M-PCSB-05-14' @ 1135
15	ML	silt at 14.75 ft			0.3/0.2		M-PCSB-05-15' @ 1140
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: M-PCSB-06
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	OL-OH	poor recovery 0-5 ft, woody landscape material			RS	reamed	
1							
2							
3							
4							
5	ML	at 5 ft, moist, grey brown SILT w sand + wood fragments. soft + wet 5.5' to 9.5 ft, then v. stiff.		1.2/3.7			
6							
7							M-PCSB-06-5' @ 1150
8							
9							
10				0.6/0.4			M-PCSB-06-10' @ 1155

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID:
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
	SP	at 10 ft, ~ 1.5 ft of Slough then wet p-g fine gray SAND w/ silt. black color (staining?. top 3" of sample) silt pockets throughout					
11							
12							
13							M - PCSJ - 06 - 12' @ 1200
14							
15				0.6/0.3			
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: M-PCSB-07
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	SW	asphalt fragments, then moist SAND + rounded GRAVEL			FT	rental	
1							
2							
3							
4	ML	at 4 ft, stiff gray SILT w/ red mottling					
5		at 5 ft, same as above					M-PCSB-07-5' @ 1230
6							
7							
8							
9							
10							M-PCSB-07-10' @ 1235

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11		at 10 ft, very moist to wet. soft at 10.5 ft at 11 ft, becomes sandy					
12	SP	at 12 ft, wet gray p-g fine SAND			0.5/1.3		M-PCSB-07-12' @ 1240
13		at 13.5 ft, becomes silty			.04/0.5		13'
14	SM				0.4/0.8		12'
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: M-PCSB-08
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	GW	moist, well graded rounded GRAVEL (backfill)					
5		at 5ft, same as above					
8	ML	at 8 ft., moist, stiff gray SILT			1.0/0.3		M-PCSB-08-8' @ 1430
10					1.3	0.5	M-PCSB-08-10' @ 1435

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID:
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
11		at 10 ft, same as above.					
		at 11.5 ft, v. moist v. fine dk gray p·g SAND					
	SP						
12					1.0/0.2		
13		from 13.5 – 14 ft, grades to SILT					
	ML						
14							
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: M- PCSB-09
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows FS	PID (ppm)	Sample ID
0	GW	moist to wet well-graded rounded GRAVEL with sand (backfill)					
1							
2							
3							
4							
5							
6							
7							
8	SP	at 8 ft, moist to wet ~~dark~~ gray pg fine SAND with trace silt. some silty lenses present. wood fragments throughout				0.8 0.3	M-PCSB-09-8' @ 1445
9							
10						1.1 0.2	M-PCSB-09-10' @ 1456

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID:
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows FS	PID (ppm) rem'd	Sample ID
11		at 10 ft, same as above. SILT at 12 ft					
12	ML					0.1/0.4	
13							
14	SP	at 14 ft, wet dk gray p-g SAND					
15							
16							
17							
18							
19							
20							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

	PROJECT:	LOCATION:	BORING ID: Alley - SB-01
	LOGGED BY:	COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	#of Blows	PID (ppm)	Sample ID
0	OL-0.1ft	organic soil + grass, then rounded GRAVEL.			5	rental	
1	GW	at ~1 ft, v. dense stiff gray					
	ML	SILT					
2							
3							
4							
5		at 5 ft, same as above wet + soft w/ abundant rounded gravel 5.5 - 6.5 ft, then stiff again.		0.9/0.4			Alley - SB-01 - 3'-5' @ 1310
6		at ~~7.5~~ dark brown w/ wood fragments					
7		7.5 - 9 ft					
8							
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID: Alley - SB-02
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0		rounded GRAVEL, then moist gray SILT w/ gravel, ~					
1							
2							
3							
4							
5		at 5 ft. same as above			150/7.8		Alley - SB-02 - 3'-5' @ 1340
6							
7							
8		HC odor at 8 ft.					
9						191	Alley - SB-02 - 8' @ 1550
10						65	Alley - SB-02 - 10' @ 1355

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

FLOYD | SNIDER
strategy • science • engineering

PROJECT:		LOCATION:	BORING ID: Alley - SB-03
LOGGED BY:		COORDINATE SYSTEM:	
DRILLED BY:		NORTHING:	EASTING:
DRILLING EQUIPMENT:		GROUND SURFACE ELEVATION:	
DRILLING METHOD:		TOTAL DEPTH (ft bgs):	DEPTH TO WATER (ft bgs):
SAMPLING METHOD:		BORING DIAMETER:	DRILL DATE:

Depth (feet)	USCS	Description	Drive	Recovery	# of Blows	PID (ppm)	Sample ID
0	GW	GRAVEL, then wet, black brown SAND.					
1							
2		at 7.5 ft stiff gray SILT w/ gravel.					
3							
4							
5		at 5 ft same as above. dry + crumbly at 8 ft			3.0 3.5'		
6							
7							
8					0.8 8'		
9							
10							

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

Attachment 3
Geotechnical Recommendations Letter Dated June 16, 2015

PanGEO INCORPORATED
Geotechnical & Earthquake Engineering Consultants

June 16, 2015
File No. 15-126

Mr. Thomas Colligan
Floyd Snider
601 Union Street #600
Seattle WA 98101

Re: **Geotechnical Recommendations**
Environmental Remediation
606 Union Ave SE
Olympia WA

Dear Mr. Colligan,

This letter provides geotechnical recommendations regarding construction details for the removal of contaminated soil at the former Olympia Dry Cleaners located at 606 Union Avenue SE in Olympia. Based on the April 2015 Remedial Action Work Plan (RAWP) prepared by Floyd Snider for the environmental remediation of the property, the contaminated soil will be excavated in a series of adjacent slot trenches which will be backfilled with controlled density fill (CDF) to a depth of about 4 feet below the existing ground surface. After completing all trenches, the remainder of the site will be backfilled with compacted sand and gravel.

Because the contaminated soil extends beneath adjacent structures, we were asked to review the RAWP and provide comments on construction procedures that may be used to avoid or reduce damage to the adjacent structures. Accordingly, the following briefly discusses our comments on RAWP and the planned construction activities.

REVIEW COMMENTS

In general, the plans are sufficiently detailed for permitting with the Department of Ecology and the comments discussed below are more applicable to actual construction details and procedures. Detailed comments are as follows.

3213 Eastlake Avenue East Suite B
Seattle, WA 98102-7127
TEL (206) 262-0370
FAX (206) 262-0374

GROUNDWATER

Artesian groundwater conditions at the site will significantly impact trench stability and the means and methods of removing the contaminated soil. Accordingly, the site contractor must realize that essentially all the excavated soil will be saturated and to expect water seepage into the individual trench excavations. Seepage will likely cause some caving of the trench sidewalls. Also, all water entering the trenches will require treatment. Consequently, the contaminated soil removal is expected to be difficult and slow and quantities of excavation spoil and backfill will be greater than neat line values.

TRENCH SIZE & BUCKET DETAILS

We anticipate that all excavations will be conducted with a track excavator. The footprint of individual excavation trenches should be limited to reduce potential caving which could affect the safety of nearby structures. Accordingly, we recommend that the individual trench lengths be limited to 12 feet and that the bucket used for the excavation be no wider than 30 inches. Additionally, we recommend using a smooth blade on the base of the bucket to reduce disturbance to the underlying soil and thereby create a sound surface for the CDF backfill to bond with the underlying soil and reduce the potential for groundwater flow at the contact with the CDF. On-site observations of the stability of the trench sidewalls may result in adjustments to the maximum trench length.

ZERO TAIL SWING EXCAVATORS

Excavation in the alley between the two buildings will likely require mini or compact zero tail swing (ZTS) excavators such as the Bobcat E35 or E45 series excavators, that can fit within the confines of the alley and reach maximum depths on the order of 10 to 12 feet for standard arm and long arm configurations, respectively.

TRENCHING ADJACENT TO BUILDINGS

Regardless of the potential use of trench boxes, all trench layouts should be located a minimum of 2 feet from existing buildings or pavements to reduce the possibility of undermining. All excavations immediately adjacent to existing buildings will need to be conducted with the presence of a representative of PanGEO who will observe the stability of the trench during excavation and provide decisions on the maximum allowable depth and length of the trench that may be excavated without undue risk of damage to the adjacent buildings. Trench excavations adjacent to the buildings must also have a full load of CDF on-site and ready for placement when excavating below a depth of 4 feet. The use of smaller equipment in the alley will likely

increase production times, which will affect trench stability. Consequently, trench excavations with smaller equipment in the alley should be limited to maximum lengths of 8 to 10 feet.

TRENCH STABILITY AND BACKFILL PLACEMENT

While the RAWP anticipated the use of trench boxes to provide lateral support to the sidewalls of the excavation, trench boxes may be difficult to use and place considering the narrow confines of the site and the required height of the boxes (i.e. minimum of 10 feet). With these constraints, trench boxes may be of marginal benefit and will likely slow construction.

In lieu of using trench boxes, we'd suggest using unsupported excavations in short segments and conducting the excavation when one or two trucks with CDF are on site to fill the trench. Anticipating that the trenches will be conducted in the wet, a line pump should be on-site for CDF placement in instances where there is more than 6 inches of water at the base of the trench.

It may be possible to dewater trenches in the native soil with a sump and place the CDF directly in the trenches without a line pump. However, trench dewatering may not be practical in many areas considering that free draining granular soils were used as backfill in prior site remediation efforts and that the granular soils would be prone to caving upon dewatering. Conversely, individual trenches may be flooded during excavation to reduce potential instability.

Conditions where tremie methods are used for the CDF placement will require pumping displaced water to Baker Tanks for subsequent treatment and disposal.

TRENCH SEQUENCING

Because of concerns of trench sidewall stability, we are in agreement with the RAWP which suggested conducting initial trench excavations on the south side of the remediation area where any caving would not endanger any existing buildings. Additionally, completing the first excavations and backfilling in the south will likely result in conditions that would restrict artesian groundwater flow to the north and thereby improve trench stability and lessen overbreak and reduce backfill demands.

MATERIAL QUANTITIES

Open excavations will likely experience some caving that will likely increase excavation and backfill quantities by about 20% over neat line quantities.

CDF

The CDF mix design contained in the RAWP has a relatively low cement content. We suggest using a more commonly available and pumpable mix design, CalPortland mix 1420, which has a higher cement content and provides a higher level of support.

Also, we recommend raising the surface of the CDF to about 6 to 9 inches below the finished site grade to avoid construction difficulties in completing the trench excavations over CDF that otherwise would have been placed to a level that is 4 feet below the existing ground surface. Also, extending the CDF to a high elevation will reduce the possibility of offsite groundwater flow.

FRENCH DRAINS

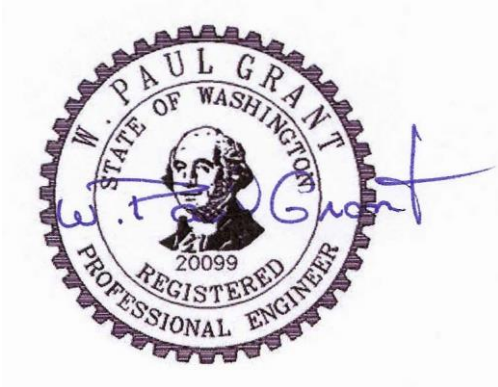
The RAWP currently shows the installation of a French drain on the downhill or north side of the remediated area to collect any near surface seepage and route it back to a collection system on the south side of the remediated zone. While this conceptual plan is sufficient for the RAWP, following construction, we suggest locating the French drain at the physically observed source of seepage.

CONSTRUCTION OBSERVATION

We recommend that PanGEO be retained to be present during the trench excavations and backfilling to confirm subsurface conditions and assess potential actions that may be needed to reduce caving and increase support to adjacent structures. We would also assist the team in providing recommendations to enhance site productivity.

We trust that the above addresses your needs at this time. Please call with any questions on this report.

Sincerely,



W. Paul Grant, P.E.
Principal Geotechnical Engineer